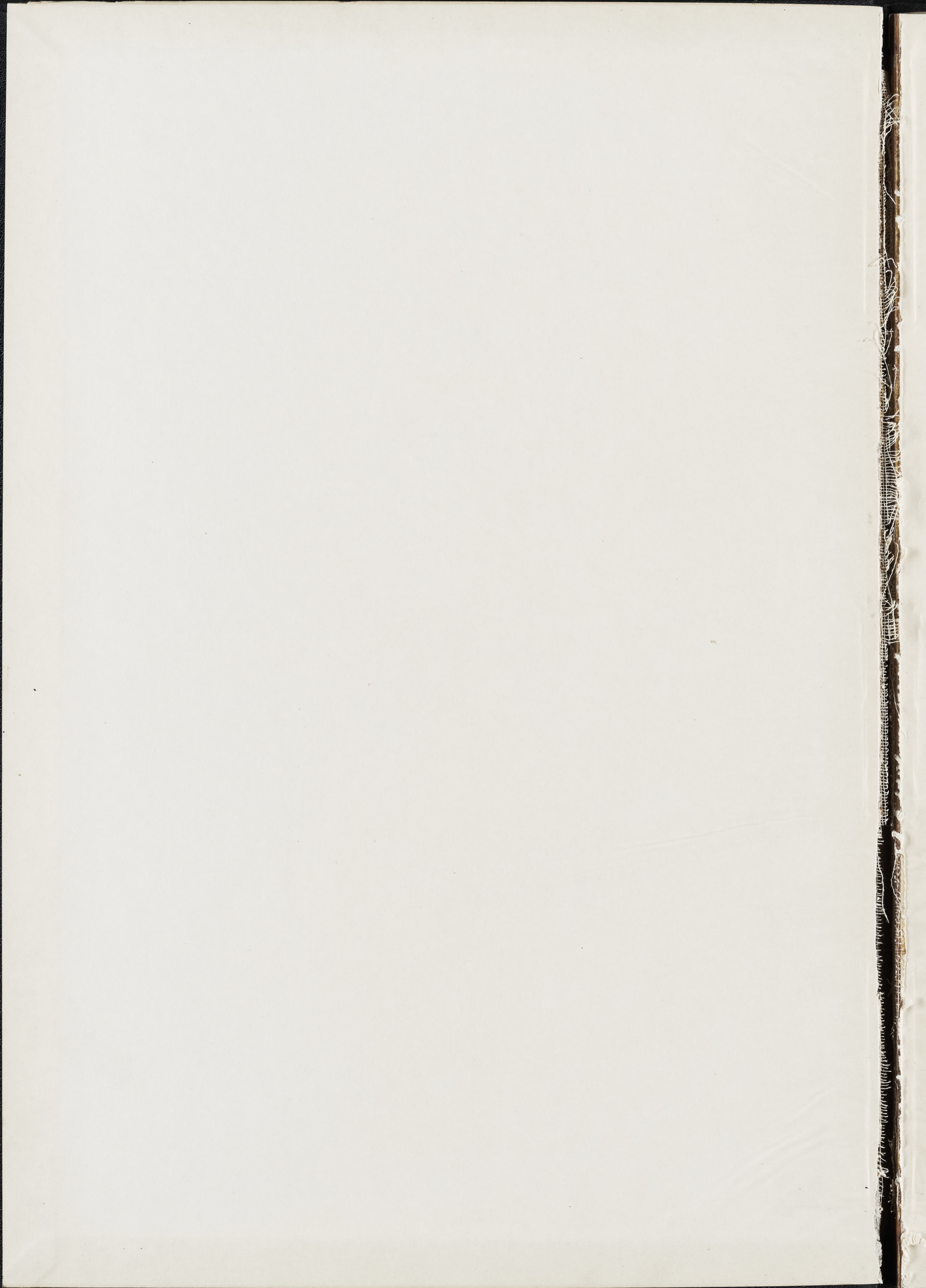
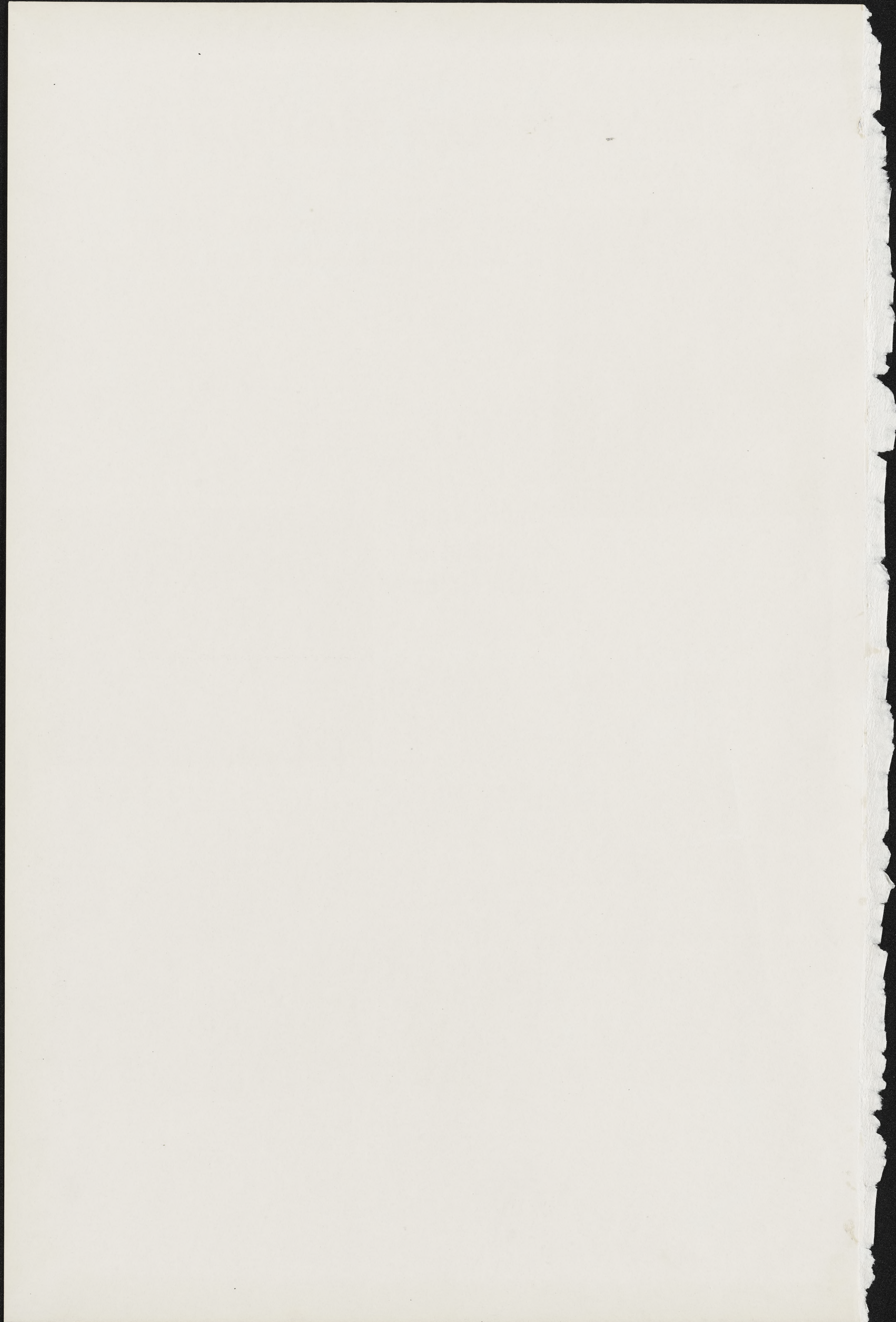


NORTHROP - NORAIR NEWS

VOLUME XXI



10 107





Northrop Norair News

Issued biweekly by Norair Division of Northrop Corporation • Wednesday, January 30, 1963

WTHORNE, EDWARDS AFB, PALMDALE

SAN ANTONIO, EL PASO



FOR FREEDOM BONDS — Thomas V. Jones, president Northrop Corporation, confers with Treasury Secretary Douglas Dillon (left) after being appointed by the Secretary to serve on the U.S. Industrial Payroll Savings Committee. Together with 27 other leading industrialists and committee members, Mr. Jones attended, at the invitation of Secretary Dillon, a briefing in the Nation's Capitol on debt management problems, fiscal and monetary policies and Savings Bonds goals for the year.

MALL BUSINESS LEADERS AT NORAIR FOR BRIEFING, TOUR

Key executives of the Government Small Business Administration received firsthand knowledge Norair Engineering and Manufacturing capability during their West Coast conference. A 14-man delegation, headed by Irving Maness, national deputy administrator for Procurement and Technical assistance, and H. Gilbertson, acting chief, Procurement and Contracts, witnessed a demonstration of the person wind tunnel and later the T-38/F-5 production line. The delegation, composed of SBA regional directors and administrators from

Chicago, Detroit, Dallas, Denver, Seattle, San Francisco, and Los Angeles, the group was hosted by Materiel executives from Northrop, North American and Hughes Aircraft, all of which were visited during the one-day whirlwind tour.

J. W. Hinchliffe, Northrop Corporate coordinator of Materiel, who, as chairman of the Aerospace Industries Association Small Business Subcommittee was instrumental in bringing the group to Norair said, "Such direct exposure to the prime contractor's need for component

(Continued on Page 3)

"Operation Jobs" Continues to Aid Personnel in Skybolt Cancellation

"Operation Jobs" — Northrop Corporation's task force effort to re-locate Northrop employees displaced by the Skybolt cancellation—this week moved into a new phase of personal service for those who still had not found new jobs. With hundreds of those displaced already in new jobs, the task force, under direction of President William Larrabee, conducted a census to determine many still need assistance. Cards were being sent to all displaced as a result of the cancellation to determine (1) whether they still sought employment, (2) to offer the very latest job opportunity information and, (3) to seek new suggestions on how Northrop can assist the combined placement program.

The new feature of "Operation Jobs" is an indexed brochure,

Latest Job Opportunity Information, containing listings by job category of employers seeking personnel. A copy of this brochure, revised to newest information, is available to every displaced Northrop employee. To obtain call the special OS 6-JOBS (OS 6-5627) or OS 6-2001 telephones.

Employers continue to report new openings to the JOBS Center as the result of the advertisements placed by the Company. At last count 312 firms had responded to these ads, listing their job openings and expressing interest in interviewing former Northrop employees.

**BUY
BONDS**

Jones Speaks for Aerospace Industry In Washington Freedom Bond Meeting

How important to America are payroll deduction sales of Freedom Bonds?

Very important, states Secretary of the Treasury Douglas Dillon.

In speaking before a group of 27 leading industrialists in Washington last week Secretary Dillon said, "The Savings Bonds program is vital . . . The people who buy bonds buy them to save. They buy them as long-term investment. Thus they provide a hard-core of assured savings placed in ways that will help avert the dangers of deflation or inflation . . .

"Payroll Savings is the only method for investing in bonds on an installment basis. For millions of Americans, the Payroll Savings Plan marks the difference between saving systematically and not saving at all."

Attending the meeting as representative of the aerospace industry was Northrop President Thomas V. Jones. He was joined by other high company officials from all over the United States in a gathering to formulate plans for Freedom Bond drives during the coming year.

Goodyear Tire and Rubber, E. I. duPont de Nemours, Inter-

national Tel & Tel, Kennecott Copper, U.S. Steel, Swift and Company, Standard Oil of New Jersey were some of the companies representing their particular industries. The group as a whole, formed the backbone of American industry, and finance.

In commenting on coming Freedom Bond campaigns that will be held soon throughout the aerospace industry, Mr. Jones said, "If purchase of bonds through payroll deduction was important last year when our Northrop campaign went over the top, it is doubly important this year. I would like to repeat

(Continued on Page 2)

Miller Voted President of AOA Group

Northrop Corporation Senior Vice-president Robert R. Miller has been elected president of the Los Angeles Post of the American Ordnance Association, it has been announced.

Among his first official duties will be to preside at the group's 27th annual dinner meeting to be held in the Grand Ballroom Suite at the Beverly-Hilton Hotel, Tuesday evening, February 12.

Honored guest and principal speaker will be Lt. General Dwight E. Beach, chief of Research and Development, Department of the Army.

Mr. Miller who was vice-president of the Association in 1962 has been a member of the AOA for many years.



NORAIR HOSTS—Nation's Small Business officials have lunch in the executive dining room during their stay in the Southland. Hughes and North American joined with Northrop in presenting industry approach to utilization of small business talents and facilities in vital aerospace defense work. From left in foreground are Mr. Hinchliffe, Mr. Maness, and Carl Hood, director, Norair Materiel.



SMALL BUSINESS LEADERS AT NORAIR—Shown with Northrop hosts during tour on recent visit to the plant, from left to right, Small Business Regional Directors Richard Lassar, Chicago, and Harold R. Smethills, Denver; Earl Rosson, Norair Small Business liaison officer; Rulon Nagely, North American Materiel director; Regional Directors Robert Phillips, Detroit, and E. L. Turkington, San Francisco; G. H. Gilbertson, acting chief, Procurement and Contracts, Washington, D.C.; J. W. Hinchliffe, Northrop Corporate Materiel coordinator; Regional Director Alvin P. Meyers, Los Angeles; Administrator Ray Martin, Dallas; Irving Maness, national deputy administrator, Washington, D.C.; Administrators Clifford D. Ryan, San Francisco; Jud White, Los Angeles, and Milton G. Danielson, Denver; Charles Kish, North American Small Business Administrator; Regional Director Robert E. West, Dallas; Louis Mentzos, Hughes Small Business administrator; Administrator Nicholas Condur, Seattle; and Regional Director William S. Schumacher, Seattle.

Tribute to a Trio

The Northrop Recreation Club. The Management Club. Safety Engineering.

Three good Northrop functions that, whether we know it or not, help make our aerospace world go around. Entirely different in purpose, there is a fine sameness

By John Breneman

about them that makes them tick.

Let's take them one at a time.

The Northrop Recreation Club, of which your correspondent had the honor to be first president, was hatched when Northrop "settled" here after moving from the Hawthorne Hotel and like Topsy "jes grew" through all these 23 years since.

The NRC must have been a right idea from the very start because it has never once faltered in its progress. Countless awards, honors that would fill a dozen tool boxes, citations galore, and hundreds of come-and-see-and-do-like-wise reps from other industries have pretty much proved the idea. Not to mention two decades-plus of recreation activity ranging all the way from archery to zithery.

But it is the long hours of behind-the-scenes toil that I wish to pay tribute to. Names? It would take thousands of names because thousands have taken part, each one, each Club member from sun-blistered rockhounds to those that are for tennis, has given something of himself.

And the NRC is built on this.

The Northrop Management Club.

Here again, as with the NRC, Northrop people have given of themselves and created something special. Of course, I'm biased. To me, anything Northrop does has to be special because Northrop is a special place.

The Management Club was started long ago in the dim days of World War II. Its first president after formal organization was R. A. "Bob" Phillips, chief, Release Control section, Manufacturing Control.

There was a time at Northrop "when" you knew everybody. Now you are indeed fortunate to have known everybody "when." We have expanded, diversified, built new facilities, and some of us have grown older. Not a few went "fishing" when they reached that three score and five. One of the most important things the Management Club has done is to maintain friendships among supervision through the years. Without this bimonthly get-together, again spark plugged by a dedicated hardworking board of control, we could be a team of strangers, and not the closely knit group who helped write the book from the old Lake Prairie days.

It's hats off to Management Club leadership also. They too by unselfish devotion of spare time and talents have created something pretty wonderful. There are two proud days in the life of a member of supervision. One, when he becomes a member of the Club and is first introduced at a meeting, and two, when that rarest of rare Northrop honors is bestowed on him—the Mug-of-the-Month.

Safety Engineering.

Safety wages a never-ending contest with hazard. Life, limb, and importantly, eyesight are their special province. And as with the other two of this trio,

much of their work is behind-the-scenes. Only when an accident brushes our shoulder, do we remember them.

Our Wise Owl Club membership now numbers 65. A Wise Owl, in case there is a Northrop Norair News reader who does not know, is a person who has avoided eye injury by wearing safety glasses.

A toe is perhaps not as important as an eye, but it's pretty important especially when it is missing. Safety toe shoes stand

FIRST NRC PREXY

During Mr. Clark's convalescence from an illness suffered just before the holidays, his Norair News writing chores for the next few issues will be taken care of by a



series of guest columnists.

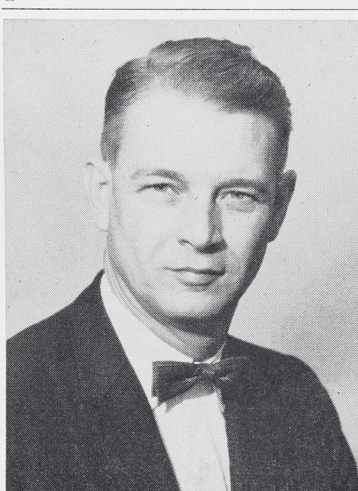
First to "stand in" is John S. Breneman, director, night Operations, and a 22-year man.

along with safety glasses in helping compile safety profits.

At Norair there are many other safety coins with just as many good sides. The air we breathe in the plant, the water we drink, aiseways, overhead clearances, ppm of toxic substances, speed limits, hundreds more, are watchdogged by Safety Engineering.

In short, at Northrop, your safety is no "accident."

A full one-third of this tribute goes to them.



THOMAS H. PRETORIUS



JONAS R. MOORE

Region Office Appointments Made by NSL

Two recent managerial appointments plus one made late last fall, have given Northrop Space Laboratories regional office representation in the key aerospace areas of the U.S., it has been announced by George Mangurian, manager, Applications Engineering and Planning department.

Members of the team and their locations:

Closest to home is Jonas R. Moore, manager of NSL's Western U.S. Regional office.

At Dayton, Ohio, Central U.S. Regional manager is Thomas H. Pretorius.

In Washington, manager of the Eastern Regional office is Lloyd K. Jensen.

All three managers will headquarter at Northrop Corporation's regional offices in their respective areas, Mr. Mangurian said.

Mr. Moore brings to Northrop 20 years engineering, sales, and management experience in commercial and aerospace industries.

He has held positions with Battelle Memorial Institute as research engineer in chemical engineering; with North American Aviation as senior research engineer; with Rocketdyne as senior program administrator where he headed a group responsible for business promotion activities with government agencies and prime contractors.

Mr. Moore was awarded his



LLOYD K. JENSEN

B.S. degree in chemistry by the University of Nevada and has continued his studies at the University of Southern California.

Mr. Pretorius, who received his NSL managership last fall, also has wide experience in aerospace fields.

As a commissioned officer he was an early participant in the Air Force Guided Missile programs as well as in weapons development projects for the Atomic Energy Commission. He has held senior engineering and management positions with Convair and the Air Materiel Command.

Mr. Pretorius has both a mechanical engineering and aeronautical engineering degree from Louisiana State University and an M.S. in nuclear engineering from Oklahoma University.

Mr. Jensen, as with the other two managers, has many years experience in military systems.

He served in the U.S. Air Force since 1941, being assigned to research and development activities for the past 16 years. More recently, he was executive officer to the Air Force chief

JUNIOR ACHIEVEMENT WEEK



HIGH FINANCE—Norair-sponsored Junior Achievers call on Division Vice-president and Assistant General Manager Operations Bob Lloyd, seated, to extoll investment merits of stock in their glowing growing companies. From left, standing, are Wendy Learner, president of PENCO J. A. Company; Al Binsacca, president, Northrop Management Club; Tom Brazil, coordinator, J. A. Norair Management Club; and Rick Israel, president, MONCO J.A. Company. Mr. Lloyd bought stock at 50 cents a share, heard from J. A. presidents that his investment "return" stood to realize a goodly 10 per cent. Young business people were hosted to lunch and plant tour.



KEEN COMPETITION—Junior Achievers from McCulloch-sponsored MA-KO Company, visit Mr. Binsacca and Mr. Brazil, to learn particulars of Northrop Management Club contest to send best J. A. vice-president, Manufacturing on all expense-paid trip to Midwest National Contest. Event which starts February 1, is open to all manufacturing V-Ps in 167 Southland J. A. organizations. For complete details call Mr. Brazil, extension 1931.

Bonds

(Continued from Page 1)

what I said ten months ago. I regard bond ownership as a patriotic duty. Moreover, every one of us should have a plan for establishing a regular savings program. I know of no better way to do this than through the purchase of the bonds of our own Government."

In recalling last year's drive and pointing up the importance of industry leadership to the well-being of the nation's economy, Secretary Dillon told the assembly, "During the past year, we tried Payroll Savings campaigns on an industry-wide basis in a number of fields. They were eminently successful. Several things helped make them so—the spirit

scientist. In this position, he worked closely with the Department of Defense and NASA in technical problem areas.

Mr. Jensen holds a B.S. degree in engineering from the U.S. Air Force Institute of Technology and has attended the University of Utah and University of Dayton and Wilmington College in Ohio.

of teamwork and pride within the industry, the availability of such industry resources as trade associations and the trade press. But, always, the determining factor was the chairman himself—and his influence and standing among the members of his industry.

"I know that you realize how much your efforts can help in the management of our debt. I know that you are all deeply concerned with the soundness of our country's fiscal position, as well as with its level of economic growth. The President's tax program will help us make giant strides forward. The Payroll Savings Plan can help us maintain our balance as we move."

Northrop Norair News

VOL. 21 NO. 1

1001 E. Broadway, Hawthorne, Calif.

A NORTHROP CORPORATION

PUBLICATION

NORAIR DIVISION

Published every other Wednesday

CHARLES BRADFORD, Editor

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DOUBLE DIAMONDS—Corporate Vice-president and Norair General Manager Dick Nolan meets with Norair 20-year personnel to present pins, to shake hands and talk about Norair progress. List of 20-year people is growing rapidly, up to and including February will number 799. Mr. Nolan is a 23-year man himself.

Nolan Presents Diamond Pins To Division's 20-year Folk

Twenty-nine Northrop personnel received 20-year service pins in January ceremony.

Their names and hiring dates:

Ray S. Mott	9- 7-42
Lloyd M. Fox	9-12-42
Franklyn Kassebaum	10-15-42
P. Stanley Osborn	11- 1-42
Lyman C. Hosier	11- 2-42
John Shanellec	11- 2-42
Roy J. Pernet	11- 5-42
Roy A. Peterson	11- 5-42
Robert D. Lawrence	11- 8-42
Dionisio R. Reyes	11- 9-42
J. Grant Macdonnell	11-16-42
Harry D. Parker	11-16-42
Frederick M. Burkett	11-18-42
Robert M. Braffet	11-19-42
John V. Edgar	11-22-42
Alice J. Runser	11-24-42
Morris M. Weiser	11-28-42
Weldon M. Ming	11-29-42

Frank C. Jeffers	12- 1-42
Nell E. Crenshaw	12- 3-42
Harold G. Haney	12- 3-42
Hazel E. Salmon	12- 8-42
Velma B. Browne	12- 9-42
Charles Bradford	12-10-42
Cecil B. Jordan	12-11-42
Griffin B. Banks	12-14-42
Edward F. Rolf	12-14-42
Jessie H. Murphy	12-17-42
Lucelle R. Ware	12-28-42

CREDIT UNION

The Northrop Credit Union will hold its annual shareholders' meeting at the Plant One cafeteria on Tuesday, February 5 at 4:45 p.m., it has been announced by Walter T. Gage, secretary-treasurer.

Haney Named Director of Advanced Missile Systems

J. E. "Jim" Haney has been appointed director, Advanced Missile Systems section, it has been announced by Welko Gasich, Division vice-president and

and technical integration studies in mobile intercontinental ballistic missiles, mobile mid-range ballistic missiles, boost glide missiles, and supersonic transports.

Mr. Haney came to Norair from Yale University upon attainment of his Master of Engineering through a mechanical engineering major. Previously, for four years, he had been with the Rand Corporation in the position of engineer.

He also attended Indiana Technical College majoring in aeronautical engineering and received his B.S. Ae in 1950.



JIM HANEY

assistant general manager, Technical.

At Norair since 1955 Mr. Haney has successively held the positions of aeronautical engineer; supervisor, Design and Analysis branch; and chief, Missile Systems Engineering.

He has been responsible for and contributed extensively to the Division's system engineering

Norair Visit

(Continued from Page 1)

products of high quality and precision manufacture is certain to give Government Small Business executives a keener insight into the important job being accomplished on aerospace programs by second-tier small business concerns."

Assisting in the Norair presentation were Al Carr, superintendent, T-38/F-5 Assembly; Stan Racisz, Research Laboratories group; and Earl Rosomme, Norair Small Business liaison officer.

NORTHROP CORPORATION BUILDS FOR GLOBAL REPRESENTATION NETWORK

Northrop Corporation has for several years been building an international network of offices and representatives to help move the company into the vast and diversified overseas markets that exist for many of our products.

The far-reaching scope of that international network came into sharp focus recently when the first Northrop consultants' conference was held in the Corpora-

tion's Paris offices. In attendance with the Northrop personnel assigned to Europe were Northrop representatives from five different European countries—France, Germany, Italy, Spain and Greece. Northrop personnel represented Norair, Ventura, Northrop Architectural Systems, and, of course, Northrop International. Nortronics and Page personnel in Europe were unable to attend the conference due to commitments in other countries at the time.

Under the direction of General Patrick W. Timberlake (USAF, ret.), Corporate vice-president and head of Northrop International, the Company has established this network of consultants—nationals of the country involved, fluent in the language, and deeply familiar with the customs and practices—in those countries which represent our principal market areas. In addition to those in Europe, Northrop is represented in the Far East, through our office in Tokyo headed by Admiral E. T. Layton (USN, ret.), and in nearly a dozen other countries.

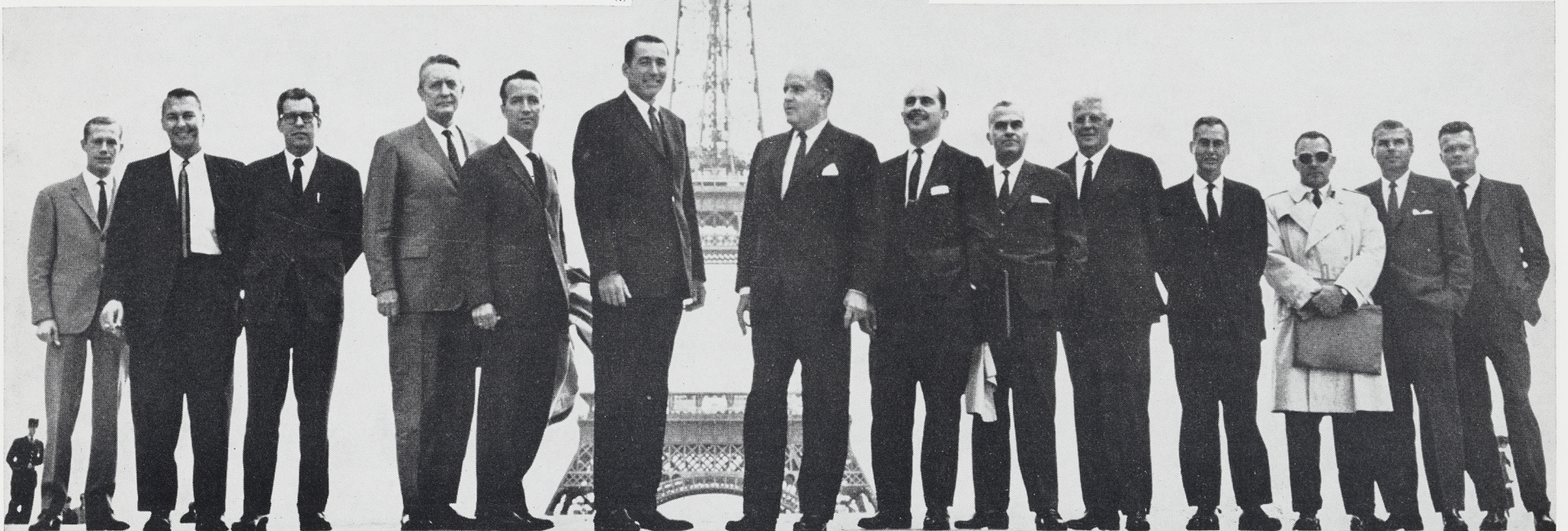
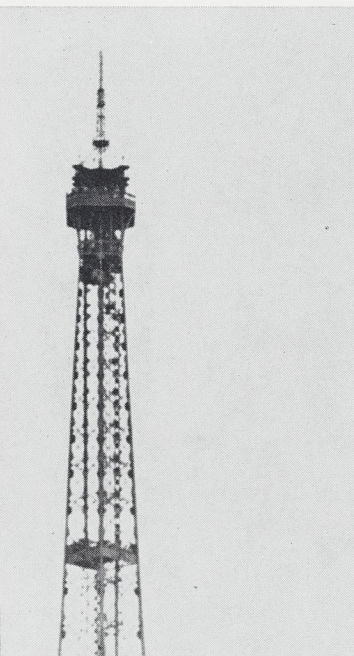
The Corporation's interests and activities abroad have grown rapidly in recent years until today products and services from every element of the company are being marketed abroad—automatic test

equipment and gyros from Nortronics, target and surveillance systems from Ventura, the T-38 and, of course, the F-5 from Norair, nearly a complete line of products from NAS, and the worldwide operation of Page Communications Engineers.

The Paris consultants' conference was held under the guidance of Geoffrey Parsons, jr., vice-president, Europe Northrop International; and Hawley Russell, director of European Operations for Northrop International.

Northrop consultants in attendance were Lt. General C. D. Geranopoulos (RHAF, ret.), Greece; Lt. Colonel Manuel Alonso (SAF, ret.), Spain; Odonne Colonna, Italy; Vivigenz Graf Eickstedt, Germany; and Jean Hinot, France.

Representatives present were Henry North, Northrop Architectural Systems, European representative; James L. Taylor, ORDAP director, Norair; John Mersch, director, Industrial Programs, Northrop International; Lee H. Smith, Norair, Bonn; Sherman Pruitt, European area representative, Northrop International, Paris; William C. Rounds, Northrop Ventura, Europe; and Jean Delachair, Northrop International office manager, Paris.



OUR MEN ON THE CONTINENT—Northrop's European team photoed in Paris during recent conference are from left, Jean Delachair, Northrop International office manager; John Mersch, director, N-I Industrial Relations; Jim Taylor, ORDAP director, Norair; Vivigenz Graf Eickstedt, Germany; Odonne Colonna, Italy; Hawley Russell, director, N-I European

Operations; Geoffrey Parsons, jr., vice-president, Europe N-I; Colonel Manuel Alonso Alonso, Spain; Lt. General C. D. Geranopoulos, Greece; Jean Hinot, France; Henry North, Northrop Architectural Systems; Sherman Pruitt, N-I European area; William C. Rounds, Northrop Ventura; and Frank Pierson, manager, N-I Public Relations. Eiffel Tower in background.



RIDES WANTED

7:30 a.m. — 4:15 p.m.

CRENSHAW & COMPTON, Gardena.
Betty Bahr, ext. 2259, OS 6-8517. 3

8 a.m. — 4:45 p.m.

CRESCENT & MARTINQUE, Cypress.
F. D. Shupenko, ext. 2123, JA 7-3535. 5HARVARD & WESTERN, Los Angeles.
Edna De Vorkin, ext. 2151. 5VERMONT & 3RD ST., Los Angeles.
Will share expenses. John Finley, ext.
1412, DU 2-6620. 5NATIONAL BLVD. & SAN DIEGO FRWY.,
Los Angeles. Joseph Cryden, ext. 1412.
VE 7-1480. 5

RIDES OFFERED

7 a.m. — 3:45 p.m.

ARBOR VITAE & HAWTHORNE BLVD.
OR PRAIRIE, Inglewood. Ruth Williams
ext. 1284. OR 7-3157. 12KNOTT & CHAPMAN, Garden Grove.
C. W. Goodwin, ext. 545, TW 3-8798. 12

8 a.m. — 4:45 p.m.

NATIONAL BLVD. & SAN DIEGO FRWY.,
Los Angeles. Joseph Cryden, ext. 1412.
VE 7-1480. 15

BBSF Classified Ads

BBSF classified ad service is provided free of charge to all Northrop Norair personnel.

Ads for agencies, commercial enterprises and private businesses are not accepted.

Deadline is noon Wednesday, one week before publication.

FOR SALE

HOSPITAL BED, fully crank adjustable, swivel casters, from military hospital, \$25. PL 4-4384. A

DISHWASHER, Kenmore portable, \$75; range, 2 ovens, Kenmore elec., \$50. 377-6459. A

TV, 21" Raytheon, console-type, mahogany cabinet, \$45. VE 8-6826. A

WASHER, Kenmore, fully automatic, runs good. \$30. OS 6-2597. A

HAIR DRYER, w/stand, professional-type, 325 watt, \$10. OS 5-3866 after 3 p.m.

PIANO, Baldwin acrosonic spinet, solid red maple, traditional style, \$750. OR 2-4446. A

TIRES, 5, 15x820, black, 4 w/less than 1000 miles, \$75. PL 4-7861. A

CHAIR, overstuffed, \$35; china closet, old-fashioned, glass, \$10; day bed, \$5. OS 6-4388. A

LOUNGING CHAIR, recliner-type, will include \$15 motor attachment if desired, oxblood navyahyde, \$80. OS 6-9989. A

BUICK, Century, 1957, h/top, 4-dr., 36,000 mi., a/c, owner, new w/w, \$700. TE 4-7823. A

CREDENZA; drop leaf table, opens to 72"x46", light walnut, 4 chairs, dark beige tweed fabric, Heritage Henredon furniture, \$175; bar stools, w/back, Cosco, 2, \$15. 677-6517 after 4 p.m. A

TRANSCIEVER, Heath Sixer, w/mike, vibrator P/S & 3 crystals, \$35. OS 6-8842. A

VOLKSWAGEN, sedan, 1959, sunroof, black, r/h, white sidewalls, vinyl upholstery, low mileage, \$1225; motor scooter, NSU Prema, 2500 miles, 4-spd. trans., foot-shift, buddy seat, luggage rack & cover, spare tire & parts, \$295. FR 6-6567. A

HOUSE, 3-bdrm., 1 1/2 baths, hardwood floors, North Torrance area, terms available, \$17,500. FA 8-5684. A

CRUISER, 18' Burchcraft, Mercury 400, 50 hp, elec. starter, Rideau steering, canopy, live bait tank, Coast Guard approved equip., skis, large wheel trailer, \$1150. DA 7-0304. A

OUTBOARD MOTOR, Scott, 7.5 hp, never used, full shift, remote fuel tank, bailomatic, cost \$280, \$160. DU 4-4017 after 5 p.m. A

FORD, club coupe, 1953, good eng., tires & radio, auto. trans., \$200. TO 1-9320. A

GUITAR, Hans Hauser classical & case, \$60. 279-1046. A

GAS STOVE, Western Holly, dble. oven, chrome top w/ariddle, \$40. NE 2-2642. A

MOBILE HOME, 1960, 3-bdrm., Jupiter, 54'x10', furn., 40' awning, \$4500. OS 5-1524. A

DRYER, Philco Bendix, elec., 1-yr. warranty, used very little, \$125. 323-9064. A

HOME, southwest Torrance, 3-bdrm., 1 1/2 baths, large covered lanai w/flagstone floor & built-in bbq. pit, w/w carpets & drapes, close to schools & shopping, \$23,000; sewing machine, Adler zia-zaq. portable, \$25. FR 8-1566. A

FOR SALE

ICE SKATES, women's, size 8-B, worn twice, \$5. DA 5-1573. A

FORD RANCHERO, 1959, \$1250; cabin cruiser, sleeps 2, 2 30 hp motors, \$795. DA 4-6203. A

BICYCLES, boy's, 20", \$15; 26", \$15; 26" 3-spd. racer, \$25; motor, Clinton, 4-cycle, just o/hailed, \$10. PL 5-4497. A

HOUSE, 3-bdrm., family room, 2 baths, carpets & drapes, built-ins, fireplace, forced air heat, patio, block wall, 2-yrs-old, Torrance area, 10% down, \$130 mo. payments, \$21,500. TE 5-7655. A

BOAT, 16', fiberglass, w/steel trailer, good condition, \$165. CR 5-4922. A

BICYCLE, girl's, 26", med. weight, late model, American-made, \$20. FA 8-3306. A

ORGAN, Conn, minuet model, w/sustain, \$1150. OX 9-6181. A

STUCCO HOUSE, in Lawndale, 2-bdrm., carpet, tile shower, large fenced yard, shake shingle roof, 5-yrs-old, small down pymt., \$8900. 833-2512. A

SINK, for service porch, 20"x16"x12", \$10; 1 hp jet pump & 50' plastic pipe, deep well, \$89; at. canning jars w/lids, \$1.25 a doz.; car cooler, 12 volt, \$17.50. VE 7-4237. A

TRIUMPH TR-3, roadster, 1960, heater, tonneau, wind winas, \$1325. HO 7-4289. A

POODLE, miniature size, black, male, \$75; female, \$85. FR 8-1686. A

RANGE, full-size Tappan, 4 burners, oven, broiler & storage space, \$15 TE 3-4226 after 5:30 p.m. & weekends. A

BEDROOM SET, modern, blonde, headboard, bedstead, Mr. & Mrs. dresser, nite stands, \$75. OS 9-6949. A

FURNITURE, large chair, end table, coffee table, 2 lamps, \$25. 371-8977. A

TOP CARRIER, auto, sturdy, \$5. 370-3023. A

DESK, modern, room divider back, 4' long w/artistic design, \$15; bassinet, wheels, \$4; Babyline crib, foot spring up-raise, \$15; playpen, wood frame, used very little, \$5. AX 2-8734 after 5:30 p.m. A

HI FI SPEAKER-CABINET, Jim Lansing low boy w/15" Stephens woofer & EV-35B tweeter, w/X-over network, \$125. TE 3-7377. A

AQUA MASTER, rea. plus tank, fins, mask & belt, \$130; Remington 740, auto., 3006 \$80, Box 101. A

WANTED TO BUY

PIANO, spinet, good condition, any color, cash, but must be reasonable. 371-9651. B

IMPROVED LOTS or land, prefer Palos Verdes, Rollins Hills area, large undeveloped land okay in Torrance or beach areas. 378-7221. B

HARDTOP for Corvette, 1956 to 1960 OR 0-0421 after 5 p.m. B

CADILLAC, 1951 or LaSalle, 1950 frame. 275-4922 evenings. B

FOR TRADE

FORD Fairlane V-8, 1956 sedan, w/auto. trans., r/h. seat belts, orig. owner, trade for 3/4-ton pickup in good condition, pref. long bed. OS 6-3792. C

FREE (to be given away)

PUPPIES. OS 6-1288. D

CATS, 2, Siamese, 2-yrs-old, brother & sister, prefer to give away as pair. 372-5807. D

RENTALS OFFERED

HOUSE, 2-bdrm., unfurn., 1 block to ocean, water paid, garage, \$125 mo. FR 9-4517 after 7 p.m. E

APT., bachelor-type, partially furn., stall shower, no children, no pets, use of auto, washer & clothes line, 10 minutes from Northrop, \$60 mo. after 6 p.m. weekdays or Saturdays. E

NORTHROP RETIREE will share home w/1 or 2 young working men or students, prefer non-smoker or drinker, 7 mins. from Northrop, cooking privileges, utilities paid, \$15 a week. PL 5-9481. E

SLEEPING ROOM, w/kitchen privileges, for working girl in a lady's home, convenient transp., in Inglewood, \$75 mo. OR 7-2934. E

PERSONALS

SINCERE APPRECIATION for the expressions of sympathy & kindness during the loss of our wife & mother, JACK FARLEY & FAMILY (Edwards). L

FOR SALE OR TRADE

POWER MOWER, Craftsman, 3 hp, 20", rotary, self-propelled, grass catcher, 1-mo-old, \$70; or trade for rug cleaner or floor polisher as part pymt. 833-2301. M

BICYCLE, 10-spd. Deraillleur, \$65 or trade for Go-Kart. 329-2076 between 4:15 & 6:30 p.m. M

STOVE, Philco elec., double oven deluxe; freezer, 18 cu. ft. upright, Sub Zero, \$50 each or will trade both for small chest-type freezer. HA 9-4150. M

CABIN CRUISER, Glasspar Delmar, 1957, American trailer, 35 hp Evinrude, \$1500 or trade for open Glasspar of equal value. 941-5240. M

BUY BONDS



NRC SEA MAIDS—The NRC-sponsored Girl Scout Mariners pose with staunch canoes built by their own hands. From left, Ester Cook, skipper; Sharon Zuelhke, Chris Shadt, Kathleen McDermitt, Claudia Black, Janet Greenlees, Mea Tegner, Yvonne Harder, Sandra Dodson, Aleta Artis, Janet Thompson, Carolyn Hunter, Kathy Stearn, Nan McKenrick, Susan Blalack, Karen Daniel, Babs Cook, Dor Zuelhke, Leona Artis, mate.

NRC Sea Maids Build Canoes, Vacation Voyage Down the Mighty Colorado River

The Colorado River recreational area is a wild and beautiful country. Each year the NRC Sea Maids make the trip down the big river in their canoes from Cibola to Lake Martinez, a three-day journey. At night they go ashore and pitch camp in the wilderness amid the peaks and canyons of this volcanic wonderland. But the story is best told by the Sea Maids themselves.

Here I was a freshman in the Girl Scout ship Sea Maid sponsored by the Northrop Recreation Club.

Gear was being packed. Our beautiful yellow canoes, all 11 of them, were loaded on top of the buses and in the truck. The canoes just like us were making their first trip down the Colorado.

After spending the night singing, talking and eating on the bus, no one had slept, we arrived at Cibola Bridge just as the sun was breaking through. Our first thought was to jump out of the bus and take a look at the mighty Colorado. We were to spend 3

By Aleta Artis

days on this old man river of the southwest.

We shoved off after getting breakfast, loading our gear in waterproof bags and canvas, lashing it to the canoes, each man taking his share, a brief talk from our skipper to obey orders and stay together.

The sun was in all its glory. The sound of the rushing current, the vastness of the desert, the tule weeds swaying in the early morning breeze, seemed to bring a certain quietness on the group. As we paddled along you could hear the dip of the paddles. Each bend in the river brought a new setting, the sky ever changing.

During lunchtime, we beached on the sandbars with the river rushing by ankle deep.

Our water fights and swimming alongside our canoes were really fun plus all our side trips exploring old Indian ruins. In the lazy afternoons we would lash the canoes together then all relax and just drift with the river.

All to soon we would start looking for a favored campsite along the bank. After spotting one, with some effort, we would clear the tule weeds away and proceed to set up camp. Soon the aroma of good food cooking filled the air.

Those of us that didn't have a chore in the galley were out looking for driftwood for the evening campfire. Soon with all

Hiking Club Newest NRC Activity

Already over the horizon—!

The newest in the NRC good timetable roster is the Hikers and Packers Club, it has been announced by Fred Armstrong, NRC president. Bob Van Allen has been elected commissioner and a program of events designed to interest a wide variety of outdoor lovers has been formed.

"The first field trips," states Bob, "are the basic type. Just to get us started on the right 'foot,' so to speak."

The first outing, a one-day affair to be held Saturday, February 9 will be a trip to the Devils Punchbowl area, two miles south of Valyermo in the San Andreas rift zone. It includes a three-mile hike from the South Fork Campground starting at 10 a.m. with the Devils Chair and the rim of the Punchbowl being the destination.

Altitudes range between 4500 to 5000 feet.

the food eaten and the galley cleaned up, there would be a certain hustle to get each mattress blown up and sleeping bag ready to crawl into.

Our last night out was initiation night for the new river rats. If you get through this you deserve to be a river rat. I'm real proud of my official river rat card I carry in my billfold because Easter 1963 I get to be on the initiation committee. Ha!

Next morning breakfast over, gear very light, we head for our destination—Fisherman's Landing. Bus and truck driver there to meet us. We clean our canoes and gear, then repack, take a hot shower, clean clothes, and lunch in the cafe, then board the bus for home.

Memories of the beauty and vast stillness. Experiences stored up. Each of us thinking, when will our skipper take us again? So ends my first river trip.

The picturesque forms of canoes could be seen as they moved silently down the river, the paddles sparkling in the sunlight timed to an unheard song.

The happy voices of the people could be heard as they broke through the morning silence.

The fires danced gaily in the fresh air as a hearty breakfast was prepared for all. After break-

By Chris Shadt

fast, when the task of loading the canoes had been finished, we were on our way again.

As we moved down the river, the high mountains leaned towering above us with their floral beauty forming a very pretty scene. Songs rose from the people and gay laughter filled the air. Everyone was having a wonderful time (not to mention the mosquitoes who weren't doing so bad themselves).

There were frequent stops on sandbars in the river for a swim, water fights, dunking. The party stopped for lunch on a sandbar about noon and, with no exceptions, everyone got wet (voluntarily, of course).

After lunch, with spirits high, we would set out once more.

As the afternoon grew, the sky filled with beautiful colors of the sunset, we found another campsite, unloaded the canoes and prepared for a good night's rest.

Dinner served and everything put away, we gathered around the fire to sing songs to the melodic tune of a guitar and story telling. When the hour grew late, everyone retired. The laughter and singing ceased and the still night air was quiet once more.

This scene continued for three days and nights until we finally pulled into Fisherman's Landing.

We arrived at the Alondra Park parking lot about 1 o'clock the next morning and having unloaded the gear and greeted our parents, we all started home with the thought of a nice soft bed to sleep on and a nice warm house (with no mosquitoes).



TAKES OFFICE—Elmer Blecksmith, Palmdale, is voted to vice-presidency of the newly reorganized Antelope Valley chapter of the Northrop Management Club. Participating in head table ceremonies during installation dinner meeting are from left, Corporate Vice-president and Norair General Manager Dick Nolan and Mr. and Mrs. Tom McCracken, Palmdale base administrator.

Elmer Blecksmith Voted Top Spot in Valley M-C

Northrop personnel in Antelope Valley have elected officers and staged the first meeting of their local Management Club since production got underway on the T-38.

Vice-president of the new Club is Elmer Blecksmith, Palmdale; treasurer is Ronald D. Wyatt, Palmdale; secretary, Frank Harrison, Edwards; and sergeant-at-arms, Fred C. Laven, Palmdale.

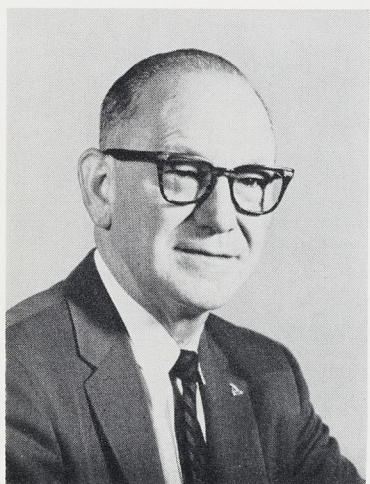
Their installation meeting was held at the Antelope Valley Inn Friday, January 18. Attending

from the home plant were Corporate Vice-president and Norair General Manager Dick Nolan and Mrs. Nolan; Northrop Management Club president Al and Mrs. Binsacca; and secretary Lou and Mrs. Perry.

The Club, a joint organization of Edwards and Palmdale, is scheduled to meet every two months with an agenda slanted toward late aerospace developments and other matters of common interest to the Antelope Valley teams. Wives will participate in the meetings.

ED SELLINGER APPOINTED BOEING REPRESENTATIVE

E. O. "Ed" Sellinger has been appointed Norair resident representative at the Boeing Company Transport Division in Seattle, it



E. O. "ED" SELLINGER has been announced by F. W. Lloyd, Division vice-president and assistant general manager, Operations.

A 20-year Northrop man, Mr. Sellinger came to the Company from Standard Oil Company of California where for six years he held the position of instructor, Sales department. From his first Northrop assignment, that of leadman, Production Control, he has advanced steadily through supervisory and staff duties in Advanced Production Control, Project Coordination and Assembly Control, and Finance (Rapid City). Immediately prior to his Boeing assignment he was staff assistant, Manufacturing Control.

Mr. Sellinger was educated at Wesleyan College, Carthage, Missouri where he majored in business and English.

He is a member of the Production Control Association of Southern California and has published numerous documents and brochures on organization, procedures, and hardware cost control.

Engineering Laboratories Scores A "First" in LFC Vibration Tests

Another first, this time in application of ground vibration tests for the X-21, Northrop Laminar Flow Control research airplanes, has been announced by Welko Gasich, Division vice-president and assistant general manager, Technical.

The new method, which solves the suspension problems associated with vibration tests on large gross weight vehicles and is equally useful on small configurations, was perfected in the Engineering Laboratories, R. B. Jackman, chief.

Design of the suspension system which was accomplished by Environmental Laboratories, Vern Cole, supervisor, was the work of a three-man team composed of Don Skilling, engineering spe-

cialist; Paul Finwall, dynamics test engineer; and Don Burke, associate engineer.

Requirements that led to the development of the system stemmed from the need to vibrate the X-21 in the near free-free symmetric and antisymmetric conditions.

A survey of the standard methods of airplane suspension used for ground vibration testing, such as deflated tires, mechanical springs, and air bags, led to the conclusion that none of these would be adequate. The air suspension system was then developed based upon the use of large air cylinders with external plenum volume to control the response frequency. This proved to be a

simple, efficient, and economical means of achieving the desired low suspension frequency.

Three vertical compression cylinders with ball joints at each end and mounted at the ground plane are used to support the vehicle's weight and control vertical translation and pitch and roll frequencies. Stability is achieved by a set of six horizontal air cylinders controlling yaw, fore and aft motion, and side motion.

Advantages of the method:

The use of the hangar floor as a ground plane jig precludes the necessity of fabricating the expensive large capacity overhead structures for airplane suspension

(Continued on Page 3)

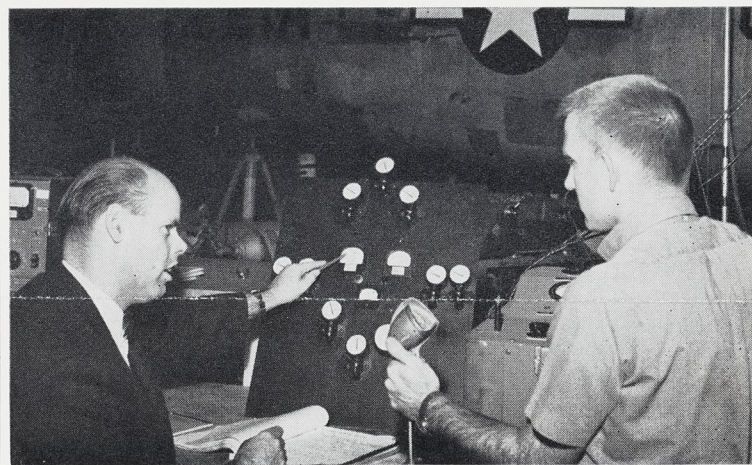
P.1127 Makes First V/STOL Carrier Hop

The first vertical flights by a jet aircraft operating from an aircraft carrier have been made by the British Hawker P.1127 from the HMS Ark Royal in the English Channel, it was disclosed last week.

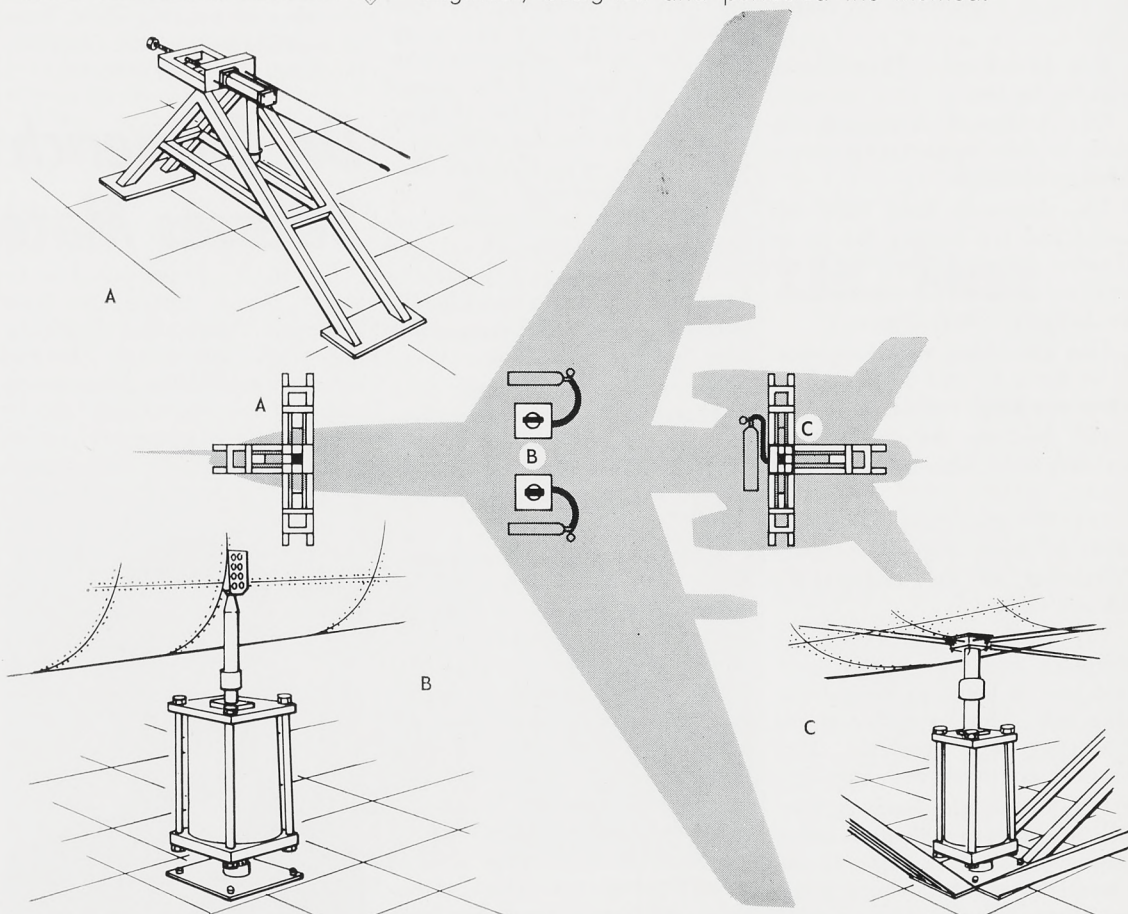
This is the first time that this operation has been achieved by any aircraft other than a helicopter.

Only last month, Hawker Sid-

(Continued on Page 2)



READOUT—New system for performing ground vibration tests is read at this console. Vehicle attitude, in this case the Northrop X-21 Laminar Flow Control research airplane, is translated and checked out here. Photo shows Don Skilling, engineering specialist, and Paul Finwall, dynamics test engineer who with Don Burke, associate engineer, designed and perfected the method.



GROUND VIBRATION MADE EASY—Drawing shows locations of the three vertical compression cylinders, one on each side at "B", and one aft at "C". Six horizontal air cylinders are at "A" and "C", nose and tail. Floor is used as ground plane jig. Note simple bolted-down anchoring method. System is readily applicable to larger or smaller vehicles. See story for details.

About Paychecks

Bacon and eggs and all the rest.

Rent. Gasoline. Television repair. Junior's teeth. Daughter's dowry. Flour. Salt and pepper. Lights, water, fishing trips. Christmas presents. Savings ac-

By George Forbes

count. Savings bonds.

Son in college. Mama's new dress.

Charity, church.

Retirement programs.

Each week at Norair, starting Thursday evening, a very necessary thing happens. A stream of pretty organization clerks trip up to the "off-site" Payroll window in Personnel and pick up a little packet and take it away with them, out to the assembly line where the T-38s and the F-5s grow. Over in Technical where new products are hatching. Down to the flight office where the pilots are. Transportation where the truck drivers are.

That little packet they take away is checks. Paychecks. Over 7000 on an average each week.

For Payroll folk the coming of the clerks means another work-week is about to start. It means that from now until next week at the same time, Payroll with the good support of Timekeeping, Personnel, and Data Processing, plus Labor Relations, Legal and the Mailroom, has a serious high-speed job to do to make sure the next week's pay is delivered on schedule.

Whoever heard of a payroll organization being behind schedule. No one. Because it has never happened. This makes it a very vital responsibility. Could you imagine the furor if it did happen, heaven forbid!

What does it take to get out a payroll and on time?

Would you like to go with me for a week, step by step. Come on. Incidentally, I'm a Scotsman. Still, after all these 40 years in America, I have what is called the brogue. Glasgow is my hometown.

But let's hurry. Time clocks wait for no man.

The workweek ends and our work begins, figuratively—every Sunday midnight.

The timecards have been collected and are waiting for us on Monday morning when we come hustling to work in our area on the balcony, Plant One.

The first thing we do as soon as we hang up our coats and set down our lunch pails is to—

(1) Add up the work hours for each card. This takes us until 1 p.m.

(2) We then hand-carry the cards by hasty dispatch to Data Processing in the Engineering Science Center.

(3) They immediately, by computer and tape, match each card and its hours to the individual's rate. This to arrive at his gross pay. The operation takes Monday afternoon and Tuesday.

(4) Meanwhile, back at Payroll, we prepare deduction information. FICA, SDI, taxes, Credit Union shares and loans, group insurance, Sears tools, AID, bonds, prescription safety glasses, Salaried Savings Plan, NRC loans and out-of-state taxes plus miscellaneous. Again hand-carry to Data Processing.

(5) Deductions and gross pay tapes are fed to the computers by the Data people. Buttons are pressed and the mechanical brains digest the information and come up with the net amount each check should read. This information goes to the printer which prints the checks and records the amount in the payroll register. All finished by Tuesday night.

(6) Wednesday morning—the entire procedure is audited by Payroll, physically, shank's mare as the saying goes, wherein man's brain double checks the mechanical one, adding the amount of each check to compare against the register figures. Completed by noon Wednesday.

(7) Wednesday afternoon, after the auditing, and the payroll is balanced and approved, we first pull the checks for the away-from-home folk. Paris, Germany, Japan, for instance, and at least 20 other states.

(8) They are hand-carried hasty delivery to the Mailroom and mailed airmail, special delivery. The Mailroom people are on the job. They put the checks on the "payday" jet express for around the world delivery points.

(9) At the same time Wednesday afternoon, the checks are sorted organizationally for the second, third, and day shifts in that order. There are over 40 segregations.

(10) Again at the same time transfers are checked and checks redirected to the proper place in case a man has moved. Finished by Wednesday afternoon when the whistle blows.

(11) Also on Wednesday, Payroll accounting functions are in process to make sure that the wages paid are entered against the correct charge, should it be contracts, burden, or overhead. These charges in turn must balance with Timekeeping's picture. When we all check out against each other, the payroll is right, ha'e nae doots.

(12) Thursday, we are on the homestretch, the high road as they say in Scotland. All final details are completed and reconciled and in the afternoon, paychecks are issued to the second shift and the third shift. Friday, is payday for the day shift, as if I needed to say. Mr. and Mrs. Northrop personnel, this includes Norair, the Corporate office, Northrop International, and Northrop Space Laboratories have their checks in hand for the hundreds of personal responsibilities that each man has.

But we are not through.

There are daily preparations for tax returns—38 of them a year to Federal and State governments. W-2 Forms must be prepared for and issued.

Your check is a much pampered instrument. Each one requires an average of 71 separate transactions before it is issued! And when you take it to the market to cash it, or deposit it in the bank, a whole new economic chain reaction begins. Butcher, baker, candlestick maker (Edison Company here).

Where does it end?

Chain reactions never end, so in effect said that giant of science, my countryman, Sir Isaac Newton. And I say, like any Scotsman worth his salt, aye mon, be thrifty and wise with that piece of paper. It represents a lot of honest toil—by all of us.

Who Will be "Queen for a Day"

Northrop ladies, particularly wives and night shift personnel, will have an opportunity to compete for the crown on KABC

TV's "Queen for a Day," it has been announced by Charles Boyle, chief, Personnel Activities.

The big date will be February 28, a Thursday.

"Queen for a Day" producers

Blood Bank At Norair February 27

The next Norair blood bank date, day shift operation, will be two weeks hence, February 27.

The location will be the Product Display Building.

Quota this time is a 10-bed unit which requires 275 donors. Organization clerks or the Personnel Activities office have applications.

The Norair blood bank balance has been strained to the limit during January, it is reported. Even on the first day of the new work year requests totaled 28 pints. Continuous withdrawals have been in process during the following weeks. A plant-wide donor support for this drive is needed.

Carrier Hop

(Continued from Page 1)

deley and Northrop Corporation, announced that they have reached agreement on collaboration in the V/STOL aircraft field, under which Northrop is acquiring technical know-how and design information on the British P.1127 and related aircraft.

The aircraft carrier trials for the P.1127, instituted by the British Ministry of Aviation, also include STOL (short takeoff and landing) operations.

A Hawker Siddeley spokesman said "the results are most encouraging and demonstrate the potential of this type of aircraft to operate from carriers at sea."

The P.1127 has flown at supersonic speeds at altitude and with its swiveling jet engine nozzles can maneuver like a helicopter, flying up or down, forward or backward, or hovering.

MR. PAYMASTER

Guest columnist this week for John B. Clark, Norair director, Industrial Relations is George Forbes, Company paymaster.

Mr. Forbes is a 20-year man and a native of Glasgow, Scotland.

He helped organize the



Northrop Credit Union considered to be one of the finest employee financial services in the industry and now serves on its board of directors and as a member of the Credit and the Nominating committees. Mr. Forbes is also Norair treasurer for AID.

DISCOUNT FOR SCOUT SHOW DUCATS AT P-A

Personnel Activities has arranged for the sale of special discount tickets to the Fourth International Sports, Vacation and Travel Show and Scouting Exposition which will be held at Shrine Exposition Hall, 700 West 32nd Street, Los Angeles, February 15 through 24.

Northrop personnel may purchase tickets for \$1 which will admit one adult or two children under 12 years.

Those attending, in addition to seeing an exciting show, benefit scouting as a whole, especially the Centinela Valley Scouts.

Dr. Emmerich Appointment Stresses Material Know-how

Dr. E. W. Emmerich has recently been named to head Materials Application Engineering work within the Material Sciences and Value Engineering group, it has been announced by John A. Van Hamersveld, chief.

Dr. Emmerich's assignments



DR. E. W. EMMERICH

include developing and maintaining a systems analysis approach for predicting the application trends of materials and processes to advanced aerospace vehicle designs. He will also be responsible for establishing areas for future materials technology studies.

Majoring in physical metallurgy, Dr. Emmerich earned his Doctor of Engineering Sciences as well as his Bachelor and Master of Metallurgical Engineering degrees at Rensselaer Polytechnic Institute.

He has included work in all phases of the titanium industry, from alloy development through mill processing to materials application, plus consultation services in connection with welding, machining, and forming of the newly utilized aerospace metal. Dr. Emmerich has also had extensive experience in R & D and quality control aspects of cold and warm deformation of alloy and stainless steels.

have arranged for a special aerospace industry showing of the famous program. The performance will originate from the Moulin Rouge in Hollywood, Sunset and Vine. Doors will open at 11 a.m. and those attending must arrive no later than 12 noon. Show time is from 1 to 1:30 p.m.

Northrop Corporation has been allocated a limited number of complimentary tickets which are being distributed at Personnel Activities on a first-come-first-served basis, two to each employee.

An added feature of this special "Queen for a Day" performance is that it will be taped and later televised on KABC, Channel 7, Friday, March 8 from 3 to 3:30 p.m.

KEN DAVIDSON AT NORTON FOR VALUE ADDRESS

Ken Davidson, Norair supervisor, Value Analysis, 5120, by special invitation of Colonel Harry B. Morrison, chief, Service Engineering, San Bernardino Air Materiel Area, has presented an overview of value engineering to Norton Engineering, Maintenance, and Procurement personnel and representatives from BSD.

His talk explaining Company methodology and techniques was supplemented by slides and physical examples of work being done at Norair.

PRECISION TOOL SHOW SET FOR DAY AND NIGHT

Precision tools, jewels by any other name.

Lufkin Rule Company will present precision tool demonstrations tomorrow, February 14 at Norair.

Day shift session will take place in Sears Norair tool store from 11 a.m. to 1 p.m. Night shift demonstration will move inside to the machine shop and will take place during the lunch hour—7:30 p.m. to 9.

A complete line of precision tools will be on display.

Tools may be purchased at the tool store for cash or by Company payroll deduction.

BOB LUXTON SPEAKS ON HOIST SAFETY

Norair's Robert S. "Bob" Luxton, maintenance mechanic and plant instructor in the care and safe operation of cranes and hoists, participated in the manufacturing section of the Governor's Industrial Safety conference held in Los Angeles, February 7 and 8.

Mr. Luxton who received a special invitation from Governor Brown spoke on the "Safe Use and Maintenance of Hoists."

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NORAIR DIVISION

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CHARLES BRADFORD, Editor

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NEW "BIRD" FOR REESE Edwards to Open Doors For U. S. Engineers Week

Reprinted from
"The Roundup," Reese AFB

When the first Talons touched their wheels to Reese runways, another era of pilot training began. The arrival of these sleek Mach busters signaled the departure of that old reliable jet trainer, the T-33.

The Talon is improvement over its "Tweetie Bird" T-37 cousin

called, is also a twin-jet trainer, but slower and simpler to fly.

When he moves into basic training with the T-38, the student will save a lot of money for the Air Force. This in turn, means that the T-33, so long a fine jet classroom for thousands of pilots, will leave the base soon. It must yield to progress, in this case the T-38.

The T-33 is no longer needed

By Captain R. W. Kimball
Information Officer, Reese AFB

in almost every respect. It's big (44 feet long and 13 feet high), heavy (weighs 13,000 pounds) and fast (flies 850 mph).

Eventually, 82 T-38's will call Reese their home.

All eight Air Training Command pilot training bases will soon have the tandem-seat T-38. Why? Because it fills a need—the need to fit new pilots into our best and most advanced planes easier, cheaper and safer—without sonic boom.

The Talon's slick, clean design makes for boomless flight. But where some say the ship looks odd, others just gaze in awe. One thing—it always causes talk.

At rest between flights, the T-38 looks like a white "coke" bottle. But when its two J-85 en-

because it's subsonic (flies slower than the speed of sound). Pilots graduating from it need more work in supersonic (faster than sound) ships before they fly sleek Air Force jets. This costs.

Not so with the T-38. When new pilots leave Reese with 130 hours of T-38 time under their belts, they won't need much more in other craft. They'll go right to their jobs—fit for the sky.

The difference between training a man in the T-33 and a supersonic plane—versus the T-38—has been set at \$15,000. To learn in the T-33 and a supersonic ship costs \$42,000. Doing the same job with the T-38 runs \$27,000. This is quite a savings at Reese alone, which graduates about 250 pilots a year.

they won't hear a boom. Besides, they will be more concerned with dodging ear-scraping crop dusters than any T-38 Reese may have at 40,000 feet.

The next year will be a busy one for the Wing. With new planes arriving, old ones leaving, instructors and mechanics specializing, and the endless string of new troops reporting, there will be a lot of overtime and few headaches.

But it will be worth it. For the men at Reese and ATC's seven other pilot training bases, this is the job. The Air Force needs pilots and looks to these bases for them.

The students come and go. They've been passing through Reese since 1949—and before that, during WWII. Next year the 15,000th pilot will be graduated from the training base which Lubbock fought so hard to get in 1942.

Who knows? Perhaps a future astronaut is training here right now, eagerly awaiting his chance with the T-38.

One thing's for sure — he'll love the T-38.

EDWARDS AFB, Calif.—The Air Force Flight Test Center will open its doors to Southern California engineers on February 19 as a part of the upcoming Engineers Week celebration.

By Presidential proclamation February 17-23, the week of Washington's birthday, has been set aside to honor the Engineering profession.

The Edwards AFB open house for engineers will be a highlight of the Los Angeles area festivities. The group will be the guests of the center at a briefing and tour of many technical facilities on the Mojave Desert base. The day will be climaxed by an Engineers Week Banquet at the officers open mess. After the dinner a panel will discuss the engineering challenge in the Antelope Valley.

Brig. Gen. Irving L. Branch commander of the Air Force Flight Test Center, will present the address — "Space Recovery Port — USA."

Following a morning briefing on the mission, facilities and capabilities of the Air Force Flight Test Center the group will

tour research activities. Included in the tour is the attitude control simulator, Dyna-Soar simulator, data processing, space positioning and a cross-section of experimental aircraft.

The T-38 will be on static display.

A tour of the NASA Flight Research Center will take the group within view of the X-15 rocket powered research vehicle, a paraglider and hypersonic lifting re-entry vehicle.

Following lunch at the NCO open mess the group will visit the AF Rocket Propulsion Laboratory for a briefing and tour. Included will be a look at the Atlas/Centaur static test facilities, and the propellant chemistry lab.

Norman V. Peterson, technical director of the Air Force Flight Test Center and former Norair head, Astro Sciences, noted that invitations to the Edwards AFB event will be sent to technical societies and educational institutions supporting Engineering Week, and to organizations employing large numbers of professional engineers.

MIT Students Complete "Semester" In Industry at Northrop Norair

The Northrop Norair fall "semester" group of science and engineering students from the Massachusetts Institute of Technology were busy last week completing visits to other divisions, bidding new friends goodbye and winding up details of their five months on the aerospace job in the Technical department.

All high-average students, the boys were part of a contingent of 50 picked by MIT to participate in the Institute's extensive Student Cooperative Program. Actual selection took place last year at the end of the spring sessions. Asked by MIT which company they liked among those in support of MIT's program to help scholars gain practical "field" experience during their years in school, the four chose Norair.

Their names: Wayne Soverns, jr., Brookline, Massachusetts; Michael Todd, Coral Gables, Florida; James Lerner, Shreveport, Louisiana; and Michael Rubin, Columbia, South Carolina.

Following the necessary coordination details between the Company and the school, they were screened by the office of Welko Gasich, vice-president and assistant general manager. Techni-

cal and when proved to be of a timber that would make them Northrop men, had they been actually looking for jobs, they were accepted and given assignments.

Their Norair tour of work during the months they were here was extensive and comprehensive. They held down positions in the Advanced Aircraft Systems, Advanced Missiles, Flight Performance, Flight Mechanics, Propulsion Systems and Environmental Control, Structural Analysis, Research and Technologies, Configuration and Design, plus others.

While here, they became Norair employees in the fullest sense. They received regular salaries. They were presented 90-day pins by Mr. Gasich. They attended technical staff meetings, where managers and directors talk straight from the shoulder about Division designs. From 8 to 4:45 each day, they full contributed their young knowledge and talents to Norair's aerospace tasks.

Massachusetts Institute of Technology seemed far away.

But there was also the lighter social side to their stay. They were special guests at a cocktail party for just-out-of-college new-

ly hired technical men. Mr. Gasich and Mr. Eyres took them to dinner more than once. They attended IAS-ARS meetings. They were shown the city.

On holidays they saw the Southland from their home base, an Inglewood apartment, South-of-the-Border, Disneyland, Marineland, Las Vegas. As it happened two of the boys were former residents of California, Jim Lerner and Mike Rubin. Jim is a native Angeleno, and incidentally is headed for a doctorate.

But now their semester in industry is over. It's farewell to Norair and the hundreds of friends they made here. Back to MIT and the book grind. Come June 1964, Wayne, the two Mikes and Jim hope to step up and be touched with that magical bit of sheepskin which will say to a world that needs them, "Heed ye all. These men are now bachelors of science."

LFC First

(Continued from Page 1)

normally associated with the use of springs.

Since the air cylinders tie in directly at the airplane jacking points, it is not necessary to fabricate heavy cradles or jig structures which would significantly increase the suspended weight of the vehicle. The only additional weight to the suspended system is the jack pad, the piston, and the cylinder rod.

The system has inherent damping sufficient to eliminate the higher suspension modes found troublesome in coil spring suspensions.

The ability to select and increase or decrease plenum chamber volume permits initial selection of suspension frequency and provides an efficient method to change this frequency if dictated by specimen response.

The instability problems associated with the use of air bag systems are not present.



READY FOR REESE—At Palmdale for pickup of first T-38 airplanes for Reese Air Force Base and being greeted by Tom McCracken, Norair administrator, are at left, Colonel Roscoe B. Woodruff, jr., commander, Pilot Training Group, and Colonel James A. Gunn III, Wing commander. First Reese T-38 supersonic trained students will get their silver wings next November.

gines whirr, this so-called "pop bottle" can streak down a runway and vault straight up to 39,000 feet in little more than a minute. Once there, it becomes a ballerina, leaping and gliding in its smooth flight dance as high as 56,000 feet.

Still, the Talon is as safe as it is strong. It can take off, climb over a mile a minute, fly at 700 mph and land—all on just one engine.

Because it's a safe, new craft, students can't wait to meet the T-38. But the Talon is a sophisticated lady, careful with whom she flies.

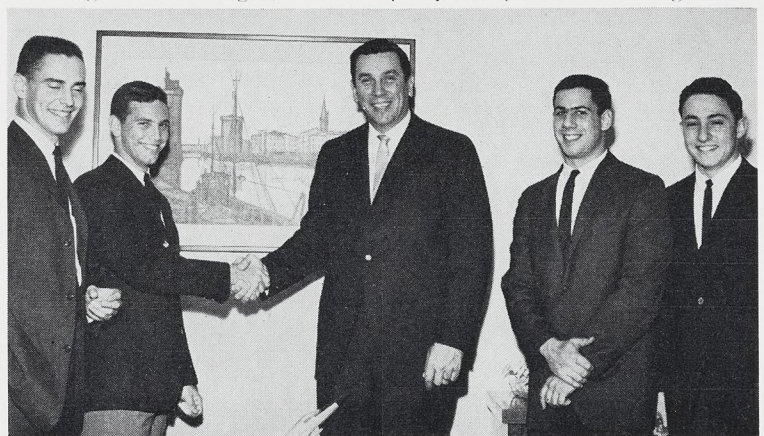
To get a date with the T-38, a man must first fly the T-37 for his first 21 weeks at Reese. The "Tweetie Bird," as it's

Supersonic pilot training is inevitable. Just as a doctor wouldn't treat a case from out-of-date texts, neither does the Air Force feel its men should learn subsonic flying in supersonic times.

Now, some booms are common—our "sound of freedom." But with the T-38, that sound will be a mute one.

When it's above 35,000 feet, the Talon's sleek design won't let a boom pound the ground. And for efficiency's sake, the instructor and student don't fly lower when possible.

To guard against a boom bothering anyone, Wing and Federal Aeronautics Administration officials have found a flying area remote from population, except for a few jack rabbits. Even



BEST WISHES AND SMILES—Norair Vice-president and Assistant General Manager, Technical, Welko Gasich, center, congratulates and bids goodbye to our four young men from MIT. From left, Wayne Soverns, jr., Michael Todd, Mr. Gasich, Michael Rubin, and James Lerner. Boys worked here for a "semester" in industry in the Institute's Student Cooperative Program.



RIDES WANTED

7 a.m. — 3:45 p.m.

VERMONT AVE. & 228TH ST., Torrance, G. E. Lehmann, ext. 1570, FA 8-0847. 2
IMPERIAL HWY. & DENVER ST., Los Angeles. Pat Hernandez, ext. 4083. 2
ARBOR VITAE & HAWTHORNE BLVD. OR PRAIRIE, Inglewood. Ruth Williams, ext. 1284. OR 7-3157. 2

7:30 a.m. — 4:15 p.m.

CULVER BLVD. & SAN DIEGO FWY., Culver City. E. D. Peden, ext. 4284, EX 1-7014. 3
MANHATTAN AVE. OR GOULD LANE, Hermosa Beach. Jayne Armstrong, ext. 1293. 94 95. 376-6369. 3
ORANGETHORPE & VALLEY VIEW, Buena Park. Via Orangethorpe or San Diego Freeway. Howard R. Lavelett, ext. 4005. LA 2-1897. 3
CANNERY & WESTMINSTER OR BOLSA, Westminster. Fred Schneeberger, ext. 1293. 531-9912. 3
223RD & ALAMEDA OR CARSON & SANTA FE, Lona Beach. Pat Smittle, ext. 672. TE 4-9205. 3

8 a.m. — 4:45 p.m.

HARVARD & WESTERN, Los Angeles. 2 blocks off of Western. Edna Ely, ext. 2151. PL 5-8369. 5
MANHATTAN AVE. & 1ST ST., Hermosa Beach. Dorothy Bonham, ext. 1712. 376-9704. 5
ARTESIA & VERMONT, Gardena. John Taurino, ext. 2687. 324-1016. 5
WILSHIRE BLVD. & 4TH, Santa Monica. Gerardo R. Demarisco, ext. 2313. 451-4294. 5
NORMANDIE & 125TH ST., Los Angeles. Darlene Becktel, ext. 2123. 754-2066. 5
LA BREA & 3RD ST., Los Angeles. Harriet Armistead, ext. 2717. 1850. 934-2471. 5
NEWPORT AVE. & FAIRVIEW, Costa Mesa. Want riders from Costa Mesa, Newport Beach & Huntington Beach to Hawthorne. J. Howard Grisham, ext. 777. 5
SPRINGDALE & GARDEN GROVE OR WESTMINSTER, Westminster. John Fisher, ext. 616. 897-9490. 5

RIDES OFFERED

7:30 a.m. — 4:15 p.m.

ORANGETHORPE & VALLEY VIEW, Buena Park. Via Orangethorpe or San Diego Freeway. Howard R. Lavelett, ext. 4005. LA 2-1897. 13
CANNERY & WESTMINSTER OR BOLSA, Westminster. Fred Schneeberger, ext. 1293. 531-9912. 13
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SPRINGDALE & GARDEN GROVE OR WESTMINSTER, Westminster. John Fisher, ext. 616. 897-9490. 15

BBSF Classified Ads

BBSF classified ad service is provided free of charge to all Northrop Norair personnel.

Ads for agencies, commercial enterprises and private businesses are not accepted.

Deadline is noon Wednesday, one week before publication.

FOR SALE

VOLKSWAGEN, 1961, 2-dr. sedan, r/h, \$1495. WH 2-7152 eveninas or week-ends (Lancaster) or Box 201.
MOTOR SCOOTER, Cushman, \$65. PL 4-4087. A
PRECISION TOOLS, Brown & Sharp, Lufkin & Starrett indicators, calipers, mics, scales, combination squares, protractors, & 19" Gerstner toolchest, value \$350. \$175. DA 9-3569. A
FURNITURE, modern, sofa, 7', green & brown tweed, \$40; arm chairs, 2, \$7.50 ea.; floor lamp, brass, \$7.50; dining room set, drop leaf table, 4 chairs, \$40. OR 2-8238. A
TRAILER, 22' Kozy coach, \$200. FR 1-8590. A
CARRYING KENNEL, for small dog or cat, \$7.50; bedroom set, 3-piece, blonde, modern, w/box springs & mattress, \$65. OS 6-3616. A
RANGE, Frigidaire elec., fully automatic, w/double broiler, deep well cooker, \$75. FR 7-4245. A
VOLKSWAGEN, 1962, sunroof sedan, white, radio & new tires, \$1695. EX 8-9918. A

FOR SALE

T-BIRD, 1960, power steering, brakes & windows, r/h, new bat. & tires, 1963 lic., 2 H/T, red w/red & white interior, 35,000 miles, \$2100. PL 7-7984. A
DRYER & WASHER, Westinghouse, matched set, 1960 delux models, 1000 series, \$200. OS 6-3589. A
PLYMOUTH, Plaza, 1956, 2-dr. sedan, 6-cyl., heater, \$300. DA 4-1592. A
GUITAR, Hawaiian elec., w/amplifier, bars, music stand, \$70. OS 6-1085. A
PLAY PEN, \$5; stroller, Welch, complete w/canopy & basket, \$7.50; bassinet, \$3.50; dining room set, 4 chairs, \$10; Hollywood bedroom set, \$35; Simca, 1948, \$110; also miscellaneous items. 676-1863 after 4 p.m. A
CHEVROLET, Impala convertible, 1960, white w/blue interior, r/h, w/w, power steering, 1963 license plates, \$1700. TE 3-9455. A
PISTOL, .45 Remington Rand automatic, blued w/black walnut grips, 3-lb. trigger pull, \$40. OS 6-4492. A
WASHER, GE Filter-Fla, 6-yr-old, motor rebuilt 1961, \$25. FR 8-3994. A
PLYMOUTH, 1957, 2-dr., h/top Belvedere, torque flight transmission new recap w/w tires, \$550. FR 1-2166. A
LOT near Apple Valley Inn & golf course, \$4000; encyclopedia, Britannica, 24 vols., 5 yearbooks, \$150; mobile home, 50'x10', 2-bdrm., 1959, 40' alum, awning \$4000. Box 202. A
BUNK BEDS, \$40; corner table, Nevermar, blonde, \$8; baby bed, \$10. FR 4-2575. A
HOUSE TRAILER, Rollaway, 8'x35', modern, completely furn., very good condition. \$1950. 325-2042 after 5 p.m.
FURNITURE, chest, 4-dwr., 7.50; typewriter table, \$6.50; breakfast nook table & 4 chairs, \$17.50; refrigerator, \$35; stove, 4-burner, deluxe size, Thermador elec. w/clock, deep well & warming ovens, \$25; store fixtures for wardrobes, gun cases, etc., \$25-\$35; glass display cases, 1' 4" & 1' 6", \$30 & \$40; clothes hangers, all types & sizes, 5¢ to 25¢ ea. FR 4-7761. A
REFRIGERATOR, 12 cu. ft. aas, Servel, 40-lb. cap. freezer section, good condition. \$90. FR 4-8036 after 5 p.m. A
APT., 4-unit, 1 3-bdrm., studio-type, owner occupied, 1 1/2 baths, fireplace, 1600 sq. ft., 3 2-bdrm. units, 900 sq. ft. each, sliding glass doors to patios, built-ins, disposals, carpets & drapes carpets, laundry room, shop or storage room, 2-bdrm. units rented, walking distance to Northrop & boulevard shopping. 1-yr-old. \$58,750. SP 2-1992. A
VOLKSWAGEN, 1957, Arctic white, radio, 1963 lic., new clutch & brakes, \$725. DA 9-4447. A
SPRITE, 1960, white w/red interior, w/w. 18,000 mi., \$1100. PL 7-6510. A
BICYCLE, Schwinn Derailleur, 15-sp., extra large frame, 27" alligator tires, chrome rack, reflectors, knock-off hubs, \$60. DA 4-1644. A
HAM RADIO EQUIPMENT, Globe 680 Scout, \$37.50; Globe linier kit, new, LA-1, \$67.50; Globe Chief, \$20; FM radio, new auto, \$35; 2 Smure dispatcher's microphones, \$10 ea.; Mylan recording tape, 1800 ft., \$1.90, 2400 ft., \$2.35. WE 3-6665. A
JOINTER, Atlas, w/stand, 1/3 hp motor, switch; 4 3/4" jointer, Craftsman, stand, 1/3 hp motor & switch, \$40 ea. FR 4-0021. A
FURNITURE, dining room set, Virtue Brothers, modern, black & 6 padded chairs, turquoise & brass, \$50; coffee tables, round, marbled top, \$15; mahogany, Nevermar finish, \$10; 2 end tables, mahogany, Nevermar finish, \$5 ea.; surfboard, Allen, 9'5", \$80. FR 7-3487. A
VOLKSWAGEN, 1960 sedan, black, very clean, \$1300. TE 3-0217. A
ORGAN, Thomas electronic, single manual spinet, w/full octave bass pedals, ebony finish, complete w/bench, like new condition, cost \$745, \$350. 834-2845. A
CADILLAC, Coupe De Ville, 1955, power brakes, steering windows & seats, r/h, \$750. DA 4-7059 eveninas or week-ends. A
BICYCLE, girl's, 26", late model, med. weight, \$20. FA 8-3306. A
WEDDING ALBUM, large, leather bound, white, \$10. 757-3693. A
VOLKSWAGEN, 1961, sun roof, oria, owner, beryl-green. \$1525. FR 5-6352
2-WAY RADIO, citizens' band, exec. model 100 w/crystals, 110 v. - 12 v. plugs, cable, Stinger antenna & mobile r/r lock, \$185. DA 6-1572. A
CAMPING TRAILER, 1/4-ton, 4'x6', w/spare canvass top, \$100. 375-9462. A
BICYCLE, 10-spd., French Derailleur, \$55 329-2076. A
DISHWASHER, 1956, GE Mobilmade, \$45. FA 1-1655. A
DOUBLE BED, w/box spring, mattress & headboard, \$55; camping equip., camp cooler, large coffee pot, pots & pans, etc., \$15. FR 6-3208. A
FORD, Fairlane 300, 1957, 2-dr., clean, r/h, auto, trans., license, good tires, new shocks & brakes, \$495. WH 2-7374 (Lancaster) or Box 203. A
SIMCA, 1959, 4-dr. sedan, w/r & h, \$575. VE 8-7846. A
STUDEBAKER, Commander, 1952, 4-dr. sedan, r/h, auto, trans., clean interior, needs some work, \$75. FR 5-8204. A
TRAILER, 2-wheeled, licensed for 1963, \$60; double spring & mattress, \$10 OS 5-2159. A

NRC Hikers And Packers List Events

Bob Van Allen, NRC commissioner of the new Hikers and Packers Club, lists upcoming schedule of events.

Lectures:

"Introduction to Equipment, Camping and Cooking" on February 14.

"Mountain Travel, Weather, Route Finding," February 21.

"Winter Travel and Snow Climbing," February 28.

"Rock Climbing," March 7.

"Desert Travel, Desert Survival," March 14.

"Glacier Travel, Climbing Dangers," March 21.

"Climbing Miseries, First Aid, Alpine Rescue," March 28.

Field trips:

"Ice Axe Practice," March 3.

"Desert Trip," March 16-17.

"Rock Climbing," March 31.

The lectures which are presented by the Los Angeles Chapter of the Sierra Club are free and open to anyone 17 years or older, says Bob.

Sessions get under way promptly at 7:30 p.m. at the Lemon Grove Playground Auditorium.

FOR SALE

2 1/2 ACRES in Golden Valley on Hwy. 68 half way between Kinaman & Lake Mohave, Ariz., terms ok., \$1000. PL 4-9711. A

RAMBLER, American, 1960, r/h, o/drive, 23 mpa, \$1100; baby crib, blonde, \$18. OR 3-4738. A

OSTERIZER, good condition, \$15; bicycle, boy's, \$10. 371-6775. A

MOTORCYCLE, 1960, BSA, 40 cu. in., \$675. UN 8-3058. A

MERCURY, Meteor station wagon, 1963, fully powered, w/factory air conditioning, 3800 actual miles, \$350 down, take over loan, \$3050 bal. OS 6-9462. A

GAS RANGE Tappan, 40", 4 burners, broiler, see-through oven, \$50; TV, RCA, 21", mahogany console, good cond., \$50. TE 3-3036. A

MERCEDES BENZ 220S, 1961, 4-dr., grey-white, dark green interior, sliding sunroof, 16,000 mi. \$3300; Volvo 122S, 1962, 4-dr., slate blue, light grey interior, \$2100. FR 5-9842. A

FURNITURE, sofa bed \$25; matching chair, \$15; end table, \$3; coffee table, \$3; & misc. OR 3-1189. A

WANTED TO BUY

CADILLAC, 1940-1947 frame, or 1940 LaSalle body. CR 5-4922 eveninas. B

FREE (to be given away)

USED LUMBER good kindling wood. OR 2-5578 after 5 p.m. D

RENTALS OFFERED

DUPLEX, furn., 3-bdrm., beach, \$175. OR 1-5267, OR 1-4845 after 5 p.m. E

HOUSE, 4-bdrm., unfurn., landscaped, on corner, can be used for home, business or profession, 4 short blocks to Northrop. \$130 mo. 833-2512. E

APT., paved parking area, patio, yard, children & pets ok, range & refrigerator available, near Aviation, 1 block south of Rosecrans. \$70 mo. Box 204. E

APT., furn., w/bath, private entrance, near LaBrea & Slauson, \$14 a week. AX 5-9997 eveninas. E

LOST

RAINCOAT, tan fabric, at Management Club meeting, ext. 2563. J

PERSONALS

SINCERE APPRECIATION for the expressions of sympathy and kindness during the loss of my husband. MYRTLE TANNER. I

FOR SALE OR TRADE

HOME, custom built 3-bdrm., family room, 1 1/2-baths, w/w carpets, range, Flair elec., stainless steel sink & many other features, \$27,500, \$20,000 F.T.D.. \$137 mo. pymt., plus taxes & ins., or will trade for smaller house as down payment. DA 6-7064. M

FOR SALE OR LEASE

HOUSE, 3-bdrm. Palos Verdes, heated pool, easy maintenance yard, available March 1, \$36,900 or lease for \$300 mo. FR 5-6095.

NRC Will Stage 4th Annual Tennis Tourney, March 3

Big news for Northrop tennis players this week is that the NRC fourth annual Club championships will be played beginning March 3.

All Company tennis players and their families from all divisions are invited to take part in this one.

A variety of attractive events for men and women, novice and experience alike, are planned.

The tournament will be played at El Camino courts.

Entry blanks are available at Personnel Activities.

Deadline is set for Friday, February 22.

SKINDIVERS IN PLANNING MEET

Come February 19 the NRC Skindiving Club, Ralph Gonzales, commissioner, will meet to formulate Club activities for 1963.

Meeting will be at the new Clubhouse, 12917 Cerise Street. Following the meeting, the Walt Disney 24-minute color film "Mysteries of the Deep" will be shown.

Skindiving trips to the Mexican Coast and Catalina Island plus social events and competitive diving are on tap.

The NRC Skindiving Club meets the third Tuesday of each month.

TRAP AND SKEET ANNOUNCE FIRST 1963 SESSION

The NRC Trap and Skeet Club has made plans to hold the first trophy shoot of 1963 on Saturday, February 23.

The Rancho Angelus Gun Club, 19140 South Main Street, Gardena will be the range. Time is 10 a.m.

Bob Bagby, commissioner, states that there will be 25 each skeet and trap targets for an aggregate total of 50. There will be five handicap classes, AA, A, B, C, and D. Placement will be based on previously established averages.

There will be trophies for the winners.

First events to be played will be the men's C and D singles.

There is a nominal entry fee of \$1 for singles and \$2 for doubles. Tennis balls will be furnished.

New high interest headliners being scheduled include the novice men's and women's singles, and husband and wife mixed doubles.

BROCHURES FOR LAS VEGAS NRC GOLF NOW READY

Flash!

Brochures of the upcoming April 27 Las Vegas NRC golf tournament are now available, states Tom Williams, commissioner.

Entries for this must of the new golf year will open next Monday, February 18.

Green River Golf Club in Santa Ana Canyon will be the tournament gathering place next Saturday, February 16. Tee time is 10:30 a.m. Green fee is \$3.50, prize fund, 50 cents for a total of \$4. There is a limit of 20 four-somes.

Signups are now in order at Personnel Activities.

RIDING CLUB TO VISIT FAMOUS HART RANCHO

The NRC Riding Club, with a successful San Gabriel trail ride February 3 already under their belts for 1963, look forward to more of the same high interest fare in the months ahead, it is reported by Commissioners Tex Statley, Norair, and Milton Sue, Nortronics.

A field trip to the William S. Hart Ranch is scheduled for Saturday, February 16 when members of the Club will meet at the main gate at 10 a.m. to view the ways of the old west. There is no charge.

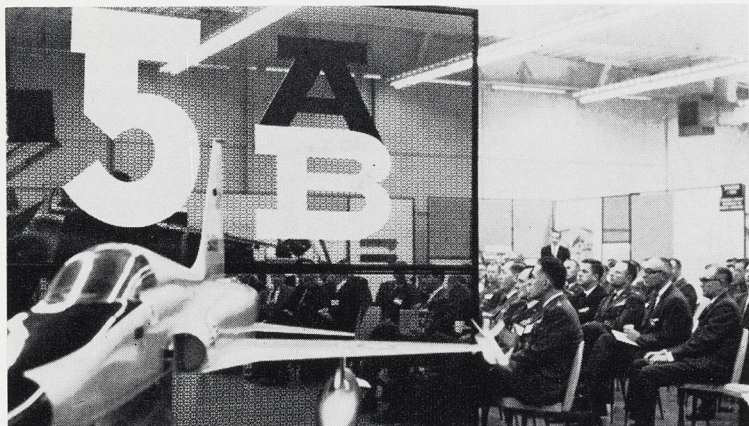
To get to the Ranch, take Highway 99 to Highway 6, turn right on Highway 6 to fork in the road. Take the left fork to Newhall and watch for NRC signs.



TROPHIES, TROPHIES, TROPHIES—The Northrop Saddle Pals are the winningest horseback outfit in the west and NRC Commissioners Milton Sue, Nortronics, and Tex Statley, Norair, prove it with this photo of trophies and mementos won in parades and other horsemanship events in the Southland. The Saddle Pals ride out of the T&L Stables in South San Gabriel and at Pop Walker's in South Gate. Meetings are held on the last Sunday of each month at 4 p.m. in the Product Display Building. All day trail rides and field trips in addition to those ever-lovin' trophy-winning parade affairs are on tap for 1963.



Preview for the F-5



WEAPONS SYSTEM CONFERENCE—The F-5 A/B weapons system was in preview last week before a 75-man team from the Department of Defense. The conference, a three-day affair, included briefings, panel discussions, and T-38 familiarization flights from Norair-Palmdale. This was first full-scale dress rehearsal for the F-5 before the actual operations men who will guide her global destiny.



CONFERENCE LEADER—Brig. General William S. Steele, deputy director of Military Assistance, OSD/ISA, Headquarters USAF, steps from cockpit following familiarization flight.



F-5 GLOBAL DUTY—Mr. Nolan, Welko Gasich, vice-president and assistant general manager, Technical, and Colonel George M. Johnson, Hdq. USAF.



F-5 PANEL—Program leaders and Norair officials in conference summation, discuss MAP fighter requirements from around-the-world view. From left, Major W. H. Cooper, SPO Liaison officer, ATC; Major Russ Rogers, AFFTC; Charles F. Condran, chief, T-38/F-5 section, MAAMA; W. E. Woolwine, Norair manager, T-38/F-5A Program; Colonel George C. Hozier, System Program director, T-38/F-5 SPO, ASD; Major John N. Badgett, chief, Program Control Division, T-38/F-5 SPO, ASD; A. J. Blood, Norair engineering specialist; Major Jack E. Mass, Office of the Director of Training, Hq. TAC; Norair's Lee Begin, chief, Product Application and Integration.

T-38 MARKS 7000 HOURS IN A-F FATIGUE TEST PROGRAM

T-38 wing and main landing gear, regular production assemblies, have emerged with colors

Post Flight Pilot Notes

As a part of the F-5 conference, Air Force men in attendance at Norair were transported to Palmdale and given cockpit checks and familiarization rides in the T-38.

A selection of remarks from their reports follows:

"Have never flown a better one in this range of maneuvers covered."

"Climbs like a bird. Nice handling machine. Seems like it would be a good formation aircraft. Wonderful engine acceleration. Very responsive to flight controls."

"Fantastic climb. Very responsive aircraft. Wonderful engine response. Reminds of a little Porsche."

"Aircraft very easy to fly with minimum ground briefing. The easibility of handling at both subsonic and supersonic is most enjoyable. Truly a fighter pilot's aircraft."

"Simplest aircraft to check and start I have ever flown."

"Excellent flight characteristics. Rate of climb to 30K is outstanding."

"Instructor gave demonstrations of aircraft capabilities in close support role which gave a better picture of future uses of the aircraft in MAP countries. Very informative flight. Found the aircraft was easy to fly and enjoyed the opportunity to fly it for the second time. Very pleased with aircraft performance. I think this aircraft will sell itself."

"Aircraft handles well, very responsive and honest. Handles very well in traffic pattern. Should be easy to transition into."

"Aircraft exceptionally clean with all gauges clearly visible. Simple starting and preflight procedures."

"Amazed at how easily the ground crew moves the aircraft around by hand."

"Am amazed by simplicity of preflight. Aircraft exceeds expectations. Enjoyed vertical 'O' air-speed recovery so well repeated same."

fly at the first plateau of the Air Force's severe and extensive fatigue test program. It has been announced by Corporate Vice-president and Division General Manager Dick Nolan.

Last week the airplane fatigue testing passed 7000 simulated flight hours and 15,000 landings. And there are still thousands more hours and thousands more

landings to go.

The tests now equal the airplane's original service life target of about 10 years. However this service life target, following conception of the T-38 test program in 1960, was increased by the Air Force to 15,000 flight hours and 37,500 landings. The fatigue test program will now proceed to a requirement of twice this figure or a total of 30,000 flight hours and 75,000 landings.

Mr. Nolan stated:

"That the trainer has performed so splendidly thus far in these tests, which are also significant to the F-5A and F-5B fighters, indicates that our predictions as to design integrity and airframe ruggedness were in line and realistic."

It was pointed out that the T-38 fatigue tests are related to the F-5A and F-5B supersonic MAP fighters in that the airplanes are of the same lightweight high-thrust family and enjoy a maximum of similarity in airframe components and systems.

T-38 aircraft have been in service with the USAF Air Training Command for approximately 18 months. The maximum accumulated flight hours on any one airplane to date is 600 hours. Additional time is mounting rapidly as student classes continue to accelerate.

Technical aspects of the Air Force fatigue certification program have been under the direction of Structures and Mechanical Systems, L. J. Yancey, chief, S. R. Murnane, supervisor of Structural Analysis and engineers George Lewis and Dave McClelland have provided the analytical and technical support.

The Norair-designed fatigue loading system is unique in itself

F-5 ON STREAM

The first F-5 MAP fighter airplane is now on the major NORAL line in the assembly building.

The article, presently consisting of the center fuselage, has progressed several stations down. The forward section is also on stream with mating scheduled in about six weeks.

This airplane will go to Advanced Production for installations and then to Edwards for flight test.

Grogan Named Director for P. 1127

George C. Grogan, Norair director, Research and Technologies section, has been made director of the Northrop/Hawker P.1127 project. It has been announced by Welko Gasich, Division vice-president and assistant general manager, Technical.

Mr. Grogan, in his new position will be responsible for coordination of functions between Norair Division, Hawker and the U.S. military establishment, Mr. Gasich said.

He will report to the office of (Continued on Page 3)

Birthday Cake



FIRST ANNIVERSARY—Richard E. Horner, senior vice-president and general manager, Northrop Space Laboratories, is shown snuffing out a candle to commemorate the first birthday of the Laboratories on February 1. With Mr. Horner are (L to R) Dr. Ludwig Roth, vice-president and manager, Research department; G. N. Mangurian, manager, Applications Engineering and Planning department, and Roy P. Jackson, vice-president and assistant general manager.

Over 38,000 Items

There is a first time for everything, for everyone, so the saying goes and I have discovered that this applies to me as well as to any man.

Being a columnist of any kind is a first, let alone being a guest columnist for John B. Clark, a

By Charles E. Murray

fine friend and staunch coworker of over 21 years standing. I am honored, pleased, challenged but a little frightened for mine is the buying game and the phrases that I usually turn are about quotes and bids and discounts. I am a pretty fair hand with a purchase order. Not so good with comma and composition.

But here goes for Industrial Supplies and Equipment.

Of course, our main job at Norair is to build defense products, hardware, flying hardware, and in this process we consume. We consume all sorts of things that never become a physical part of the product. This is industrial supplies and equipment.

Hold on to your hat. In a year we will use 38,000 different non-product items. Over 10,500 of these are regularly listed in Company catalogues as being available off the shelf. As for hats, we buy hats too, pilots' helmets for one. You name it and we'll buy it. Incidentally, that catalogue list of 10,500 requires a running inventory of half a million dollars in consumer goods, a fortune to be sure, but vital and necessary to rapid schedules and the high degree of flexibility an aerospace company must have. From brooms to sweep the floor to a perfect hexagonal quartz crystal for a space age requirement. You are right, we buy the services that print this very newspaper and the editor's blue pencil which he no doubt will use on this masterpiece with good effect.

Tools, facilities, buildings, trucks, station wagons, stools, desks, window glass, pencil sharpeners.

That service pin you are wearing, that timecard you punch and the timeclock you punch it with and the coat hanger you hang your coat on.

BSA Policy



EXECUTIVE BOARD — Dick Nolan, Corporation vice-president and Norair general manager, has been elected a member of the 1963 executive board of the Los Angeles Area Council, Boy Scouts of America. Mr. Nolan is a past member of the North Orange County Council. The 96-member executive board determines policy and procedures of operation for scouting throughout the Southland.

The medicines in our hospital, the X-rays, bandages. The camera that shot your smiling ID. Your group insurance booklet. Your company-furnished safety glasses and again your hat, hard hat, that is.

The form you sign for Freedom Bonds, your patent award pin, rivet gun, bucking bar, welding torch, drawing boards and velums. Just name it. If it is in plentiful supply, we in Materiel are dutybound to fill your order yesterday. If it's hard to get, today or tomorrow. If it doesn't exist, you might have to wait until next week.

Many years ago, when I counted my birthdays from summer to summer, I started in Northrop Purchasing in downtown Los Angeles in the Mode O' Day building at Washington and Hill Streets. How long ago did I say? Quite awhile. Long enough ago to have a 4-digit telephone number — OR 9-111. How primitive can things get?

Our Company was growing so fast it was difficult to find buildings to house personnel.

In August 1943 we were brought home to Plant One because Engineering, at that time located upstairs in Plant One, moved to new quarters in Plant Three and Receiving to the new Plant Two, a major relocation and somehow a steppingstone symbol of Northrop's taking its place in the industrial firmament. Company facilities had up to then been makeshift, make-do, and scattered. And all-out war needs pushing us at every hand to make things even more chaotic. With this tremendous change, we suddenly became for the first time in our young history a complex. Northrop's future was something we had all believed in from the very first and this gathering of the team under one "roof" at the Field was additional proof that our new company was to endure good times, bad times, come what may.

Reminiscing a little further, I wonder how many of you remember the blackout and camouflage era. The vast amount of chicken wire and feathers which completely covered the place. The anti-aircraft guns on the roof, the bomb shelters all around. Northrop from the air was a peaceful farmstead basking in the California sun complete with a winding road, a pasture and a haystack with little hint of the ferocious 40-millimeter gunned night-flying, radar-equipped Black Widow in hammer and tongs production underneath it all.

Also who remembers when the cafeteria was called the Pylon. They had a pylon on top of it. Thirty feet high. It had to come down for the chicken wire. And how about the bond drives in the old days with Loretta Young, Gary Cooper, God rest his soul; Eddie Rickenbacker, the Mills Brothers, Rudy Vallee and his Stein song and Hoagy Carmichael and his Buttermilk Sky.

HARPER WELTON MADE V-P FOR AIA COMMITTEE

Harper R. Welton, head, Norair Logistics Packaging Engineering, 3965, has been elected national vice-chairman of the Aerospace Industries Association Preservation and Packaging Engineering Committee, for the year 1963.

'TALKATHON' ON PAPER WASTE

The Management Research and Services section has introduced "Operation Roundfile" as one of the payoff methods for reducing costs in the Northrop

FROM MARIPOSA

Charles Murray, Materiel Purchasing agent, Industrial Supplies and Equipment, is guest columnist for this issue.

Mr. Murray, a 21-year man and a member of the Materiel organization since the early days of World War II, is known throughout the Southland for his astute knowledge



of market sources and availability of materiel. His buying know-how has many times made the difference between on schedule performance and costly delays for Northrop contracts. He has been president and a member of the board of control of the Northrop Management Club. His offices are located in the Mariposa facility.

MISS STOCKMAN NEW AUDITOR FOR NORTHROP

The Air Force auditor general has appointed Miss Eunice Stockman as Department of Defense audit coordinator, it has been announced.

Miss Stockman, a member of the Air Force Audit Service since 1942 succeeds Harold D. Parsons who has been reassigned to North American Aviation.

Miss Stockman begins her Northrop tour of duty following a three-year assignment as resident auditor, North American Autonetics Division. With the exception of the eastern and southern district offices, Miss Stockman has served in supervisory positions in all of the Air Force establishments including those in Europe and Japan.

COL. LASSITER, THULE MAN, MADE GENERAL

The Air Force News Service reports that President Kennedy has nominated Colonel O. F. Lassiter, Strategic Air Command, to the temporary rank of brigadier general.

Colonel now General Lassiter. News readers will recall, was in command of Thule Air Force Base at the time of Aircor's visit there and was featured in the News series "Operation Quickfreeze".

"Operation Quickfreeze" was a detailed story of Northrop Scorpion operations in the Polar wastes.

General Lassiter was among 37 colonels nominated to general officership by the President.

Norair 1963 cost reduction program. Leo Richman, chief, Records Management, made 39 presentations in 18 working days to 821 supervisors and clerical personnel.

"Mr. Richman made as many as five presentations in one day," said B. R. Bonnett, director, Management Research and Services, "and he has spread the word to all Hawthorne departments, to Mariposa and to Palmdale."

The objective of Operation Roundfile is to reduce paperwork costs and its slogan is "If it isn't necessary, get rid of it."

In his memorandum authorizing "Operation Roundfile", Corporate Vice-president and Norair General Manager Dick Nolan noted that the yearly bill for Division paperwork is approximately \$8 million. This figure includes the cost of paper, printing, and man-hours expended in producing paper. "Experience shows," Mr. Nolan stated, "that a careful 'is it necessary' analysis of departmental paperwork will always reveal areas where real and substantial savings can be made."

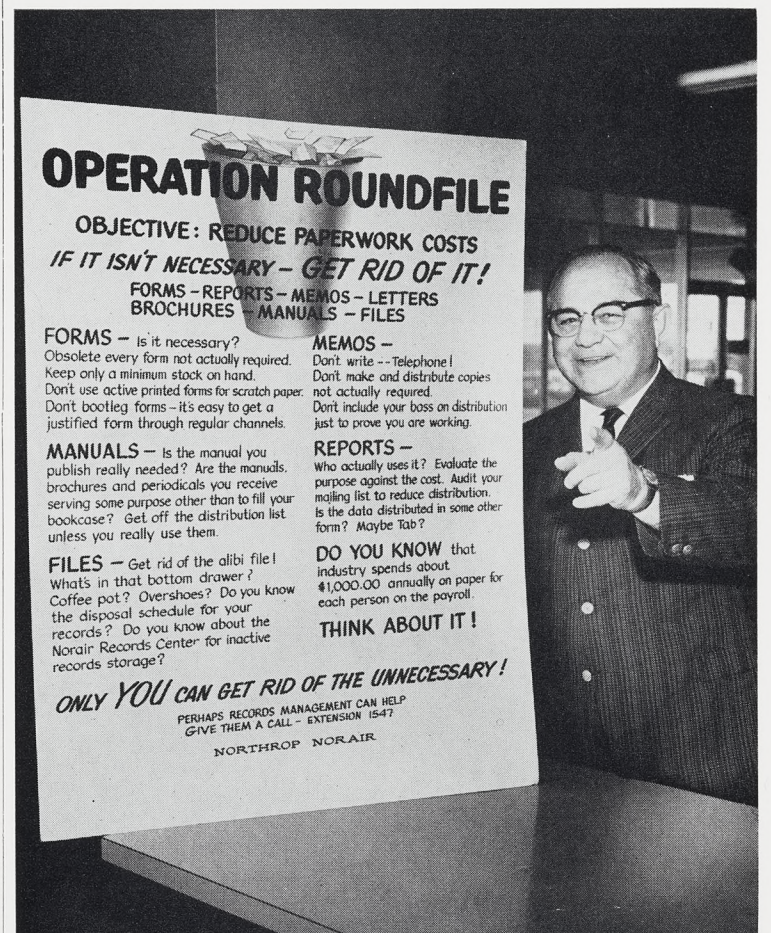
"Operation Roundfile" urges all plant personnel to be on the look-

out for excess paperwork and to eliminate this waste wherever found. Results of the program are already gratifying."

Among the challenging data presented was the fact that there are almost 100,000,000 individual pieces of paper in Northrop Norair office files and the Records Center at any one time. Further, this Division spent approximately \$2 million for forms alone in 1962. This figure is derived from application of the Hoover Commission formula which states that the cost of using forms is 15 to 20 times the cost of the paper and printing.

Speaking of his plant presentations, Richman said, "This was a talkathon but the reactions of the listeners made it worth while. The particular point that created the most interest was the little pink slip offered as a tool for getting off the mailing list for manuals, reports, memos, brochures, periodicals, and all other paper which people didn't need, didn't want or hadn't requested."

The little pink slips, Form 1400RM-25, may be obtained from Richman's office or the Engineering stockroom.



OPERATION ROUNDFILE—Leo Richman, chief, Records Management, puts emphasis on importance of paperwork reduction during one of his 39 plant presentations. He spoke to over 821 supervisors and clerical personnel in an around-the-clock "talkathon" series.

NSL APPOINTS MILAN A. CHIBA TO P-R POST

Milan A. Chiba has been appointed Public Relations representative for the Northrop Space Laboratories, it has been announced by Norman Warren, director, Corporate Public Relations and Advertising for Northrop Corporation.

Mr. Chiba retired recently from the United States Air Force in the grade of lieutenant colonel. His most recent assignment was as deputy chief of the Public Information Division, Office of the Secretary of the Air Force, at the Pentagon. He also served as chief of Information for the Air Force Special Weapons Center at Albuquerque, and as a public

information officer for the Atomic Energy Commission at Los Alamos, New Mexico. In prior assignments he worked as a reporter and as an editor for several newspapers in the southwest.

Mr. Chiba is a graduate of Stanford University. He and his wife and three daughters reside in Palos Verdes, California.

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CHARLES BRADFORD, Editor

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T-38 Tests

(Continued from Page 1)

and highly efficient and well organized both as to the program and test equipment.

The wing is repeatedly pulled and twisted as the loading system "flies" the test specimen through all the maneuvers the T-38 makes in flight. Subsonic and supersonic symmetrical pull-ups, left and right subsonic rolls and gust conditions are simulated. Flaps down and speed brakes open conditions are also fed into the sequence as some of the pull-ups or rolls are executed. A total of 55 different wing loading conditions are applied.

Landings are simulated with load on the wing and ailerons, and vertical, drag, and side load on the landing gears. Also, taxi, engine runup, hard braking, and braking and turning conditions are applied. There are a total of 75 different landing gear conditions. These various conditions are applied in a random order to closely simulate the experience of an average T-38 in service training future Air Force pilots.

The loads on the wing, ailerons, and flaps are distributed by means of "whiffle-trees" and rubber tension pads. Distributed

loading provides a more realistic loading of local areas of the specimen.

The loading system components are hydraulic cylinders, pressure sensitive servo valves, hydraulic pump unit, load feedback transducers and an electronic programmer unit. The load transducers and electronic programmer unit were designed and built by Engineering Laboratories, R. B. Jackman, chief.

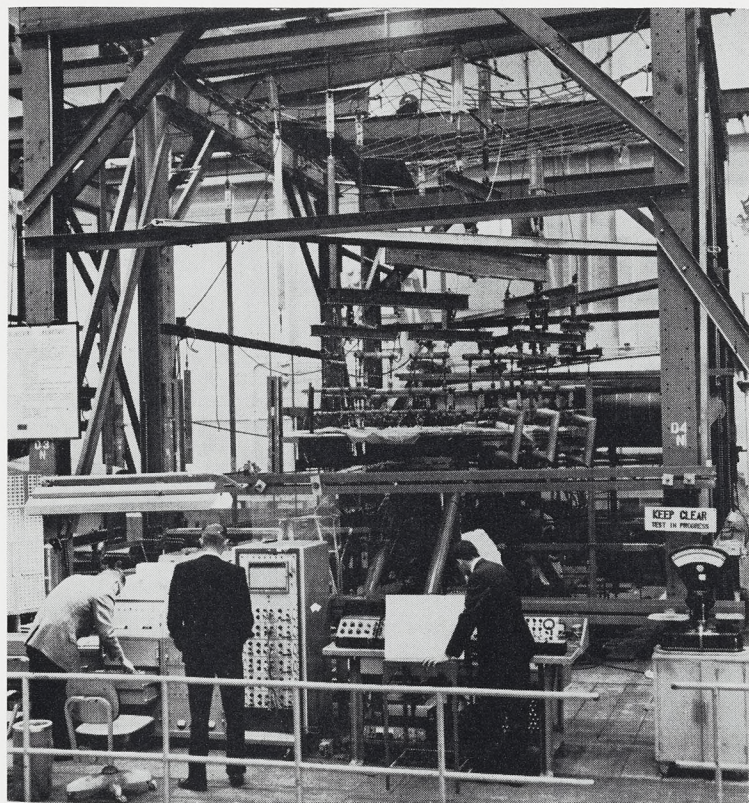
The T-38 fatigue test program is being performed by the Mechanical Laboratory, C. J. Gordinier, supervisor.

F. A. Grabowy, senior engineer, is in charge of the complete T-38 fatigue certification test program which includes sonic fatigue testing of structural components, engine inlet ducts and the forward fuselage and nose landing gear.

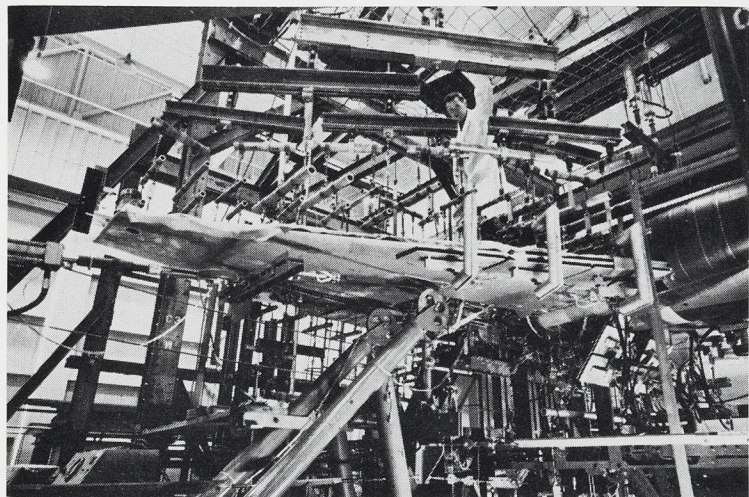
The wing and main landing gear loading system design and conduct of the tests is the responsibility of D. C. Atmur, senior engineer.

Load programmer was designed by W. L. Worthington, engineer.

It has required an average of two weeks of test time to simulate one year of aircraft service.



T-38 FATIGUE TESTS—Photo shows T-38 fatigue tests under way in Engineering Laboratories. From left at data recording console and test controls are D. C. Atmur, senior engineer; Dave McClelland, senior engineer (Stress group); and Larry Kaps, test engineer. Program has passed 7000-hour mark which is equal to 10 years in flight operation. Tests, under Air Force contract, will continue to simulate 30,000 flight hours and 75,000 landings.



OVERWHELMED—Trainer's trim little wing and landing gear are almost lost in maze of test cables, attach pads and "whiffle trees" which pull and haul this way and that way for over 55 different wing conditions and 75 landing gear conditions to simulate as nearly as possible every movement of the airplane even including engine runups. On wing above is Frank Hendrickson, lab technician. Test specimens are regular production run.

"Open House" at NRC Clubhouse



TURN KEY CEREMONY—NRC Council gathers at the new Clubhouse, 12917 Cerise Street for key turning ceremony. From left, back row, Gene Boggess, past president; Commissioners Claude Pike, Stamp Club; Tom Williams, Golf; Ester Cook, Girl Scouts; Morris Cary, Symphonaires; Fritz McLarney, Figure Control; Howard Converse, Gem and Mineral; Earl Lambrecht, Square Dancing; Howard Cornelius, Travel; John Pawlicki, Surf; Jack Wilson, Model Railroad; Thurman Sharp, Camera; Bill Wareing, Boy Scouts; Representatives Byron Pierce, F. E. Brant, and Don Riddle. From left, front row, Commissioner Tex Statley, Riding Club; B. R. Doyle, sergeant-at-arms; Commissioner E. C. Bentley, Coin; Dorothy Walls, secretary; Bert St. Gean, representative; Dave Carney, past president and special events chairman; Del Gardner, representative; Don Kohler, Personnel Activities staff; Commissioner Bob Van Allen, Hikers and Packers; Fred Armstrong, president; Commissioner Dick Cade, Gun; Mae Hawkins, vice-president; Commissioner Max Douglas, Camping; Jim Celoni, past president; Commissioners Bill Myerson, Bowling, Joe Perez, Softball; Roy Wolford, past president.

Grogan

(Continued from Page 1)

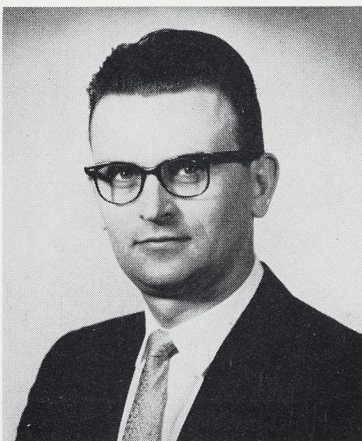
the vice-president and assistant general manager, Technical.

Dr. L. R. Fowell, chief of Propulsion and Aeroballistics group, will follow Mr. Grogan as director of Research and Technologies section.

Mr. Grogan who has served as Norair chief of Aero Propulsion Sciences in addition to his direc-



GEORGE C. GROGAN



DR. L. R. FOWELL

torship in Research and Technologies has been active in aerospace sciences since 1948 when he entered the industry with General Dynamics/Convair.

He was educated at the University of Oklahoma where he attained his B.S. in mechanical engineering in 1945 and at the Massachusetts Institute of Technology where he earned his M. S.



RECREATION FACILITY—Charley Boyle, chief, Personnel Activities, presents key to the new NRC Clubhouse to Club President Fred Armstrong. The new facility which in addition to regular NRC activities, provides the perfect place for departmental socials, is open Tuesdays through Fridays, 3:30 to 10 p.m. It is also open Saturdays for special events. Call Personnel Activities for schedules.

in aero engineering and was a graduate assistant, 1947 to 1948. He also held the position of graduate instructor at Southern Methodist University in 1954 to 1957 during a program of night school studies.

Mr. Grogan has published numerous scientific papers including "Slender Bodies of Low Wave Drag", "Application of Theoretical Aerodynamics to the Design of High Performance Aircraft" given at IAS winter meeting, 1959, "An Engineering Approach to Missile/Rocket Optimization Problems", and "Aeronautical Research in USA".

He is a member of the NASA Aircraft Aerodynamics committee, and is an associate fellow of the American Institute of Aeronautics and Astronautics and the Royal Aeronautical Society.

Dr. Fowell who is from Manitoba came to Norair in 1960 from Convair Division of General Dynamics-Fort Worth where he held the position of project aerody-

namics engineer and lead engineer and lead engineer for inviscid flows research. Previously he was a research assistant for the Canadian Government Defense Research Board, Institute of Aerodynamics, University of Toronto. He was also a pilot in the RCAF.

Dr. Fowell received his B.S. and M.S. in mathematics, physics and chemistry at the University of Manitoba, Winnipeg. He also did graduate work at the University of Toronto and in 1955 was awarded his Ph.D. in applied mathematics and aeronautical engineering.

He has published numerous scientific papers including "Exact and Approximate Solutions for the Supersonic Delta Wing", Journal of Aeronautical Sciences, August 1955; "Flow Field Analysis for Lifting Re-Entry Configurations by the Method of Characteristics", given at IAS national summer meeting, Los Angeles, June 1961.



RIDES WANTED

7 a.m. — 3:45 p.m.

MANHATTAN BEACH BLVD. & HIGHLAND, Manhattan Beach, Maude E. Bisho, ext. 1470, FR 6-6002. 2

CRENSHAW & 235TH STREET, Torrance, Edna Berry, ext. 1200, 326-6425. 2

7:30 a.m. — 4:15 p.m.

ARBOR VITAE & HAWTHORNE BLVD. OR PRAIRIE, Inglewood, Darleen Gunion, ext. 691, OR 7-0112. 3

CENTURY BLVD. & PRAIRIE AVE., Inglewood, L. Novak, ext. 2026. 3

8 a.m. — 4:45 p.m.

CENTURY & WESTERN, Los Angeles, Edna Ely, ext. 2151, PL 5-8369. 5

LA BREA & MARKET ST., Inglewood, Jeanne McClintock, ext. 1383. 5

190TH & AVALON, Gardena, J. J. Piechocki, ext. 541 & 1381, NE 9-5629. 5

AVALON & SEPULVEDA, Wilmington, Ivan Weekly, ext. 1412. 5

ARTESIA & VERMONT, Gardena, John Tourino, ext. 2687, 324-1016. 5

RIDES OFFERED

8 a.m. — 4:45 p.m.

190TH & AVALON, Gardena, J. J. Piechocki, ext. 541 & 1381, NE 9-5629. 15

AVALON & SEPULVEDA, Wilmington, Ivan Weekly, ext. 1412. 15

BBSF Classified Ads

BBSF classified ad service is provided free of charge to all Northrop Norair personnel.

Ads for agencies, commercial enterprises and private businesses are not accepted.

Deadline is noon Wednesday, one week before publication.

FOR SALE

REFRIGERATOR, 6 cu. ft., aas, excellent cond., fine for mountain cabin or trailer, operates w/butane aas. \$30. OR 7-4731.

CHEVROLET TRUCK, 1/2-ton, V-8, deluxe cab, r/h, aood tires, aood enaine, \$1195; boat, 16'9", Calbuitt, plywood & glassed, 60 hp Scott, elec. starter, perfect for skiing or fishing, H. D. trailer w/15" wheels. \$675. DA 6-7064. A

RANGE, Autolec aas, about 1956, full-size, \$25. FR 7-4437. A

PUPS, German Shepherd, born Feb. 4, 1963, pedigree, no papers, males, \$30, females. \$25. NE 5-4098 or HA 5-6996.

FM TUNER, Harman-Kardon Counterpoint, \$25; amplifier & preamplifier, Harman-Kardon, \$15; amplifier & preamplifier, CalRad. \$20. OR 4-9599. A

HOUSE, ranch-style, swimming pool, 2-car garage, on 1/4 acre in Morningside Park, 10 min. from Northrop, \$29,950. PL 4-7861. A

2 1/2 ACRES near Northrop Palmdale, zoned M1 1/2. \$30 down, \$30 mo., \$3000. OR 3-0462. A

REFRIGERATOR, Norge, \$150; washers, Whirlpool, auto., \$40, Maytag, washer-type, \$30; range & oven, Welbilt aas, \$40; table & chairs, utility-type. \$15. OS 9-7578. A

DOG, German Shepherd, AKC reg., license & all shots, black & tan, 11-month, aood w/children, needs large run area. \$30. 675-6700. A

REFRIGERATOR, Norge, cross-top freezer, \$50. 679-8426. A

BOAT, 16' Fleetwood Ambassador, remote control, 35 hp Mercury elec. motor w/generator, tiltable trailer, 4 life preservers, ski rope, etc., \$650. OW 7-3328 after 6 p.m. A

CLARINET, wooden Evette, \$75; bicycle, girl's, 3-spd., \$18. FR 8-3383. A

T-BIRD, 1957, 1963 taas, orig. owner, new paint, black, 2 new tires, recent tune-up, w/w, r/h, porthole top, \$2100. FR 5-3128 after 6 p.m. or weekends. A

PONTIAC, Bonneville, 1960, 2-dr., h/top, super stock, 4-spd., 3 two's positraction, aood tires, chrome wheels, tach., headers, record player, \$2350. DA 3-9820 days. DA 4-8189 evenings. A

MOTOR SCOOTER, elec. starter, 4-spd. foot shift, buddy seat & luggage rack w/cover, 3000 mi., \$295. FR 6-6567. A

OLDSMOBILE, 1954, 2-dr., r/h, w/w tires, auto, trans., aood cond., \$325. OS 6-3110. A

CHRYSLER, New Yorker Com. V, 1957, full power, \$700. FR 1-2531. A

BICYCLES, boy's, 20", \$15; boy's 24", \$20; girl's, 20", \$15. PL 5-4497. A

CADILLAC, Coupe DeVille, 1959, all extras, inc. cruise control, new tires, 40,000 actual miles, \$2995. FR 4-6315 after 5:30 p.m. or weekends. A

FOR SALE

OLDSMOBILE, 1954, 4-dr., factory air-conditioning, power steering & brakes, 1963 plates, aood transportation, \$395; Plymouth, 1956, V-8, stick-shift with o/drive, 280 cu. in., new tires, 1963 plates, r/h, \$695. PO 3-8559. A

BABY CRIB & MATTRESS, \$15. 379-7122. A

HOME, 3-bdrm., 1 1/4 baths, 4 1/2-yrs-old, h/wood floors, 1 block from new school, attached 2-car garage, 2 shopping dis., aarbaae disposal, formica sink tops, terms. \$17,500. FA 5-6884. A

FORD, 1957, 4-dr. custom sedan, 6-cyl., stick shift, w/w, 1963 plates, \$395. OR 0-3902. A

TRANSCEIVER, citizen's band, executive model 100, w/crystals, 12 V & 110 V plugs, key locking mobile bracket & antenna. \$185. DA 6-1572. A

BAND SAW & BELT SANDER, Craftsman, w/motors & heavy duty stands, \$95 for both. OR 8-1339 after 5 p.m. A

CADILLAC, 1954 Coupe DeVille, r/h, power brakes & steering, \$525; Ford station wagon, 1954, \$325. FA 0-2097. A

TRANSCEIVER, Heath Sixer, AC & DC P/S, 4 crystals, mike, mobile mount & antenna. \$25. OS 6-8842. A

VALIANT, 1962, all extras, \$1785; aaaa luna, twin tanks, regulator, \$75; stereo record player, \$45. 376-4947. A

BICYCLE, girl's, 26", med. weight, late model, \$18. FA 8-3306. A

DINING ROOM SET, solid walnut, 5 chairs, \$35; occasional chair, blonde, \$4; Coleman lantern, \$2; sprinkler hose, \$1; telephone chair, blonde, \$5. OS 6-4388. A

CHEVROLET, 1953, stick-shift, 6-cyl. sedan, aood tires, motor recently o/hauled, new parts, aood transportation, \$200. DA 9-2298. A

PLYMOUTH, 1954, 4-dr. sedan, std. trans., aood transportation, \$175. DA 3-8531. A

SCUBA DIVING EQUIPMENT, Aquamaster regulator, single tank w/reserve, fins, mask, weightbelt, depth gauge, \$120; rifle, Remington 740, 3006 semi-automatic. \$70. 675-7465. A

DISHWASHER, GE, automatic, portable, \$75. VE 8-7846 after 5 p.m. A

CHEVROLET, Impala, 1961, white w/red upholstery, 23,000 miles, auto, trans., r/h, 2-dr., V-8, h/top, \$1990. PL 5-7783. A

CORVAIR MONZA, 1962, maroon w/black interior, r/h, w/w, bucket seats & seat belts, 4-spd. stick, \$2050. OR 2-5306. A

CHEVROLET, 1959 El Camino, 348 cu. in., 315 hp, tri-carb., stick shift, new rubber & paint job, \$1700. OS 9-6695. A

BICYCLES, 26", balloon tires, boy's, 3-spd., Schwinn, \$25; girl's, \$20. FR 8-4574. A

WINDOW, 17"x15" camper or trailer louver, screen, frame, glass & shield, \$8. OS 6-5926. A

PIANO ACCORDION, beginner's, 120-bass, \$100. OS 6-8331. A

BEDS, twin, maple, \$50; 1/3 hp motor, heavy duty, \$15; paint compressor w/Sharpe gun & hose, \$50. FR 1-6894 after 5 p.m. A

BOAT, 15 1/2', sport fisherman, home-made, w/cabin, 30 hp Johnson motor, portable bait tank, trailer w/normal size wheels, \$700. 371-9730. A

FALCON, 1961 Tudor, Fordomatic, radio, aood tires, take over loan, no down payment, \$67.75 mo., \$1218 balance. OL 4-7529. A

LAWN MOWER, power, 20", reel-type, 4-cycle Briggs & Stratton eng., \$20. OS 5-1842. A

WANTED TO BUY

PIANO, aood condition, any color, cash, but reasonable. 371-9651. B

PROPERTY, Rolling Hills, for sale by owner. FR 7-3487. B

BICYCLE, boy's, med. size, reasonable price. FR 9-4517 evenings. B

\$10 REWARD for information regarding purchase of carburetor for 1930 Graham-Paige sedan, models 44-45-46. Will personally call for it, if within 150 miles of Los Angeles & consider complete car for parts if price is right. RE 1-3608. B

FOR TRADE

FORD Fairlane V-8, 1956 sedan w/auto, trans., r/h, seat belts, orig. owner, trade for 3/4-ton pickup, pref. lona bed. OS 5-4343. C

FREE (to be given away)

PUP, German Shepherd, 3-mo-old, female. Box 301. D

RENTALS OFFERED

NORTHROP RETIREE will share home w/1 or 2 young working men or students, prefer non-smoker or drinker, 7 mins. from Northrop, cooking privileges, utilities paid, \$15 a week. PL 5-9481. E

APT., 2-bdrm., parquet floors, close to work, children OK, \$100 mo. PL 6-0998. E

ROOM for working girl in quiet, refined home w/private bath & kitchen privileges. \$15 week. OS 6-9567. E

APT., to share, 2-bdrm., furn., 5 min. from Norair, utilities inc., \$140 mo. 676-6693. E

APT., unfurn., 1 large bdrm., w/w carpet, drapes, stove, refrigerator, aarage, upstairs, \$95 mo. DA 9-0314. E

Burton Wins Green River, Vegas SRO

The April 27 Las Vegas golf tournament is full, sold out, even over-subscribed, states Tom Williams, commissioner.

But things are still going on here in California. Next tournament coming up is to be held at Gilman Hot Springs, over San Jacinto way on Saturday, March 16. This will be an 80-player affair with green fees pegged at \$4. Tee-off time is 9:30.

The next one after Vegas, May 26, is set for El Rancho Verde.

Scores from the Green River affray show Leonard Burton the winner with a gross score of 74.

He was pushed hard by Mac McLarney and Gene Trusty who shot top low net spot with 65.

First flight was won by Ken Wood, 68. Second flight, Lou Morgan, 67. Third flight, Art Richards, 68, and fourth flight, Ron Metro, 67.

Credit Union Announces 1963 Board

Northrop Credit Union members have elected the official family for the organization for 1963, it has been announced.

Board of directors and officers for the year will consist of Bill Schramm, president; Ralph Hampton, vice-president; W. T. Gage, secretary-treasurer; Dick Carroll, Leo Richman, Hugh Watson, and J. R. Willson.

Supervisory committee consists of R. G. Van Allen, chairman; Don Anderson, and C. G. Collins.

The credit committee is composed of J. L. Dew, chairman; L. W. Monger, and F. E. Wolfe.

It was also announced that the three officers, Mary Delaney, assistant secretary-treasurer; Mary Josalle, assistant treasurer; and Florence Montgomery, cashier, were officially reconfirmed for the coming year.

At the February Credit Union board meeting, action was taken to raise the maximum for savings deposits from \$3000 to \$5000.

Dividend rate for 1962 is being determined and will be announced shortly.

In the financial report for year ending December 31, 1962 it was revealed that profits climbed during the year to \$104,915.41 up from \$85,085.07 in 1961.

RENTALS OFFERED

ROOM & BOARD or room, \$15 week, 679-6588 after 5 p.m. or weekends. E

APT., duplex, modern, children & pets OK, large yard, patio, paved parking area, range & refrigerator available, \$70 mo. OS 5-1123. E

PERSONALS

SINCERE APPRECIATION for the expressions of sympathy & kindness during the loss of my father. LILLIAN GILL. L

MEMBERSHIPS available in A & E Flying Club based at Hawthorne Airport, Cessna 140, \$4; 170, \$6; 172, \$6.50; Bonanza, \$10, dues \$12 month, nominal initiation fee. Prospective members invited to meeting Wed. Feb. 27, 7:30 a.m., Product Display Bldg. DA 4-2992. L

FOR SALE OR TRADE

MOTORCYCLE, 62 Honda 50 Sport w/63 plates, \$210 or trade for aood hauling trailer as part pymt. HE 5-2558. M

WASHER, GE Filter Flow, \$50 or trade for aood maple knee-hole desk or double dresser. 675-8332. M



TENNIS AT LA JOLLA — NRC Tennis Club members photoed recently at La Jolla Beach and Tennis Club are from left, standing Bill Lewis, Russ Black, Chet Druliner, Ed Horgan, and Dick Carter. Seated from left, Joe Kline, Maxine Lewis, Bill Lurie, Grace Horgan, John Meyer, Art DaSilva, and John Potts. The trip was a weekend affair in which matches were played between Northrop and La Jolla Tennis Club members. If tennis is your forte, and new players are always welcome, inquire at Personnel Activities for participation information.

Early Entry Urged for NRC Summer Bowling

The NRC summer bowling leagues have been programmed and alleys assigned, it is announced by Norair Commissioners Bill Myerson and Corinne Davis.

New Series in NRC Posture Classes

The second series of NRC figure control and posture classes will get under way February 27, it has been announced by Fritz McLarney, commissioner.

People can join these classes anytime, states Fritz. Just come on over. Location is the new NRC Clubhouse at 12917 Cerise, just one block east of Yukon and one block south of El Segundo. Cost is \$5 for 14 sessions. Registration is at the Clubhouse on opening night.

Wear slacks, shorts, swimsuits, or leotards. No shoes or slippers. Socks preferred.

Miss Judith Eudice, a charm school and posture authority, will be in charge. The exercise routines are done with musical accompaniment.

BOYS, DADS, MOMS, NEEDED FOR NRC CUBS

The call is out for cub scouts, states Bill Wareing, NRC Scout commissioner. The Club-sponsored Cub Pack 262C needs boys — and fathers, and mothers — to help make the spring program a success. Fathers for committee positions, mothers for den duty. Boys' ages for cub qualification are 8 to 11.

The Pack meets on the fourth Friday of each month with the next meeting scheduled for March 22.

NRC SKI PLANS NEED PRAYER FOR SNOWSTORM

The Ski Club folk have announced a meeting for March 4, 8:30 p.m. at the Clubhouse.

Details of the March 8 weekend trip to Mammoth will be di-

List of leagues, location, and type of play follows.

Monday, 6:25 p.m., Tropicana, a mixed 4 handicap, with ten teams. Starts May 6.

Tuesday, 6:25 p.m., Del Mar, mixed 4 scratch, 570-585, 8 teams. Starts April 30.

Wednesday, 6:15 p.m., Missile, mixed 4 handicap, 640 maximum, with 10-12 teams. Starts April 24.

Wednesday, 6:25 p.m., house to be determined, men's scratch trio, 510-520, with 8 teams. Starts April 17.

Thursday, 6:25 p.m., Southwest, mixed trio, 500 scratch, 10 teams. Starts April 25.

Thursday, 6:15 p.m., Missile, mixed 4, 630 maximum, with 10 teams. Starts April 25.

Thursday, 4:30 p.m., Del Mar, men's 495 scratch trio, with 10 teams. Starts June 6.

Entry forms are available at Personnel Activities.

MANAGEMENT CLUB TO TOUR ANHEUSER-BUSCH

The Northrop Management Club has scheduled a night out for members Thursday, March 7 at which time there will be a tour of the famed Anheuser-Busch Brewery in the San Fernando Valley, it has been announced by Al Binsacca, president.

Wives and husbands are invited for the tour and dinner with total number of accommodations limited to 150. Reservations are on first-come-first-served basis.

Bus transportation will be furnished leaving from the Engineering and Science Center at 5 p.m. The party is due to meet in the Rathskeller Room from 6:30 to 7:30 p.m. Tour of the brewery is 7:30 to 8:30 p.m. Barbecue dinner from 8:30 to 9:15 with return to Norair arriving at 11 p.m. Price for the entire trip is \$1 each.

All members of the Management Club have received circulars with reservations attached.

vulged. The Club will stay at McGee Creek for this.

"Meantime," says Fred Armstrong, NRC president, "everybody pray for snow!"



Northrop Norair News

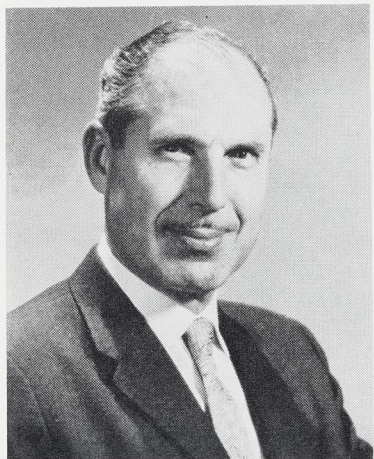
Issued biweekly by Norair Division of Northrop Corporation • Wednesday, March 13, 1963

HAWTHORNE, EDWARDS AFB, PALMDALE

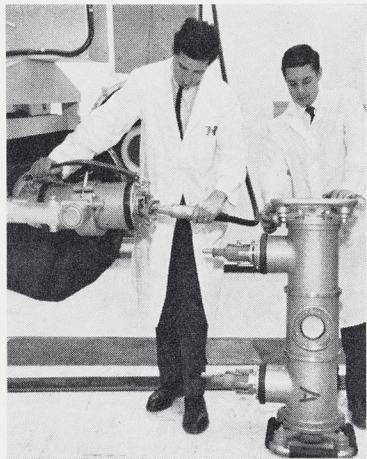
SAN ANTONIO, EL PASO



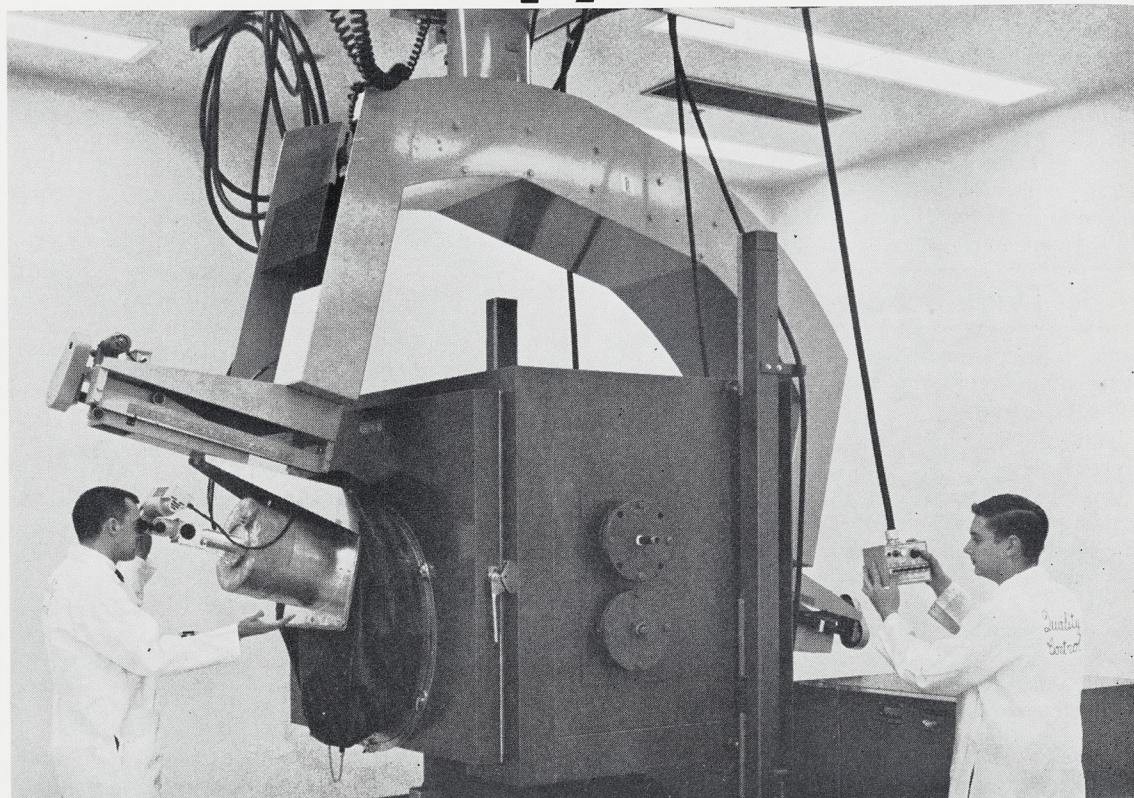
BLACK BOX X-RAY—Here contact points are observed in motion under most severe conditions to be encountered in flight. Laboratory can video tape action in slow motion, stationary at any point in operation cycle, or at normal speed. Movies, still photos, tape record of all conditions are part of inspection recording system.



BOB CATLIN — Mr. Catlin, manager, Norair Quality Control, states, "Invaluable aid from the Air Force and a fine Norair team effort brings our in-motion fluoroscopic system into operation on schedule."



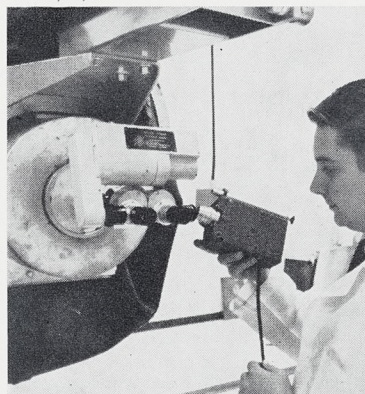
BIG GUNS — The high-intensity X-ray tubes used to scan hidden working parts. The one now mounted at left can "see" through two inches of aluminum. Big Daddy on right, can see through four inches of steel.



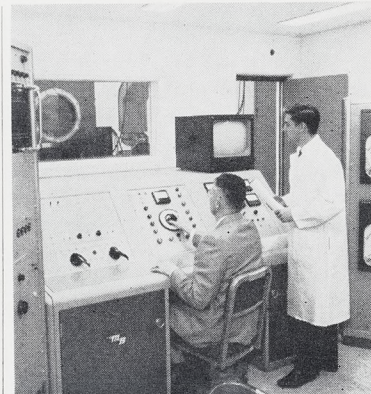
FOR QUALITY ASSURANCE ON THE T-38 AND THE F-5—Unique and sophisticated, Northrop Norair's new Functional Multi-environmental Fluoroscopic Test System, now completing its shakedown program will soon be at work X-raying black boxes and other hidden working parts on the trainer and the fighter. Photo, taken in Quality Control's Mariposa Quality Analysis Lab shows Q-C men Jim Highland, technician and Phil Bickal, lead engineer, positioning X-ray tube and image intensifier.

NASA Contract

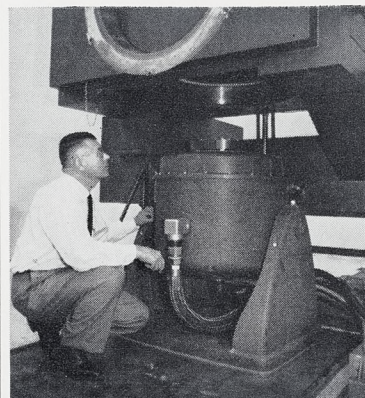
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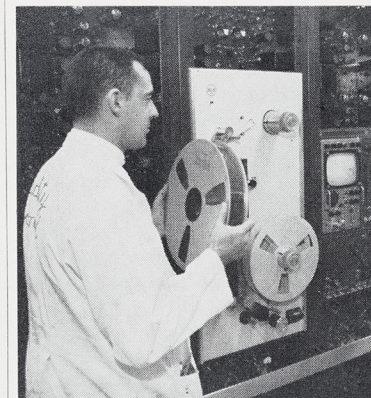
CAMERAS AND OPTICS—Phil Bickal illustrates how cameras, 16 - millimeter movie or still, will be hooked into test optical system. Binocular is for visual observance by way of image intensifier which is contained in heavy cylinder. Housing above contains TV camera which feeds picture to closed-circuit screens in control room.



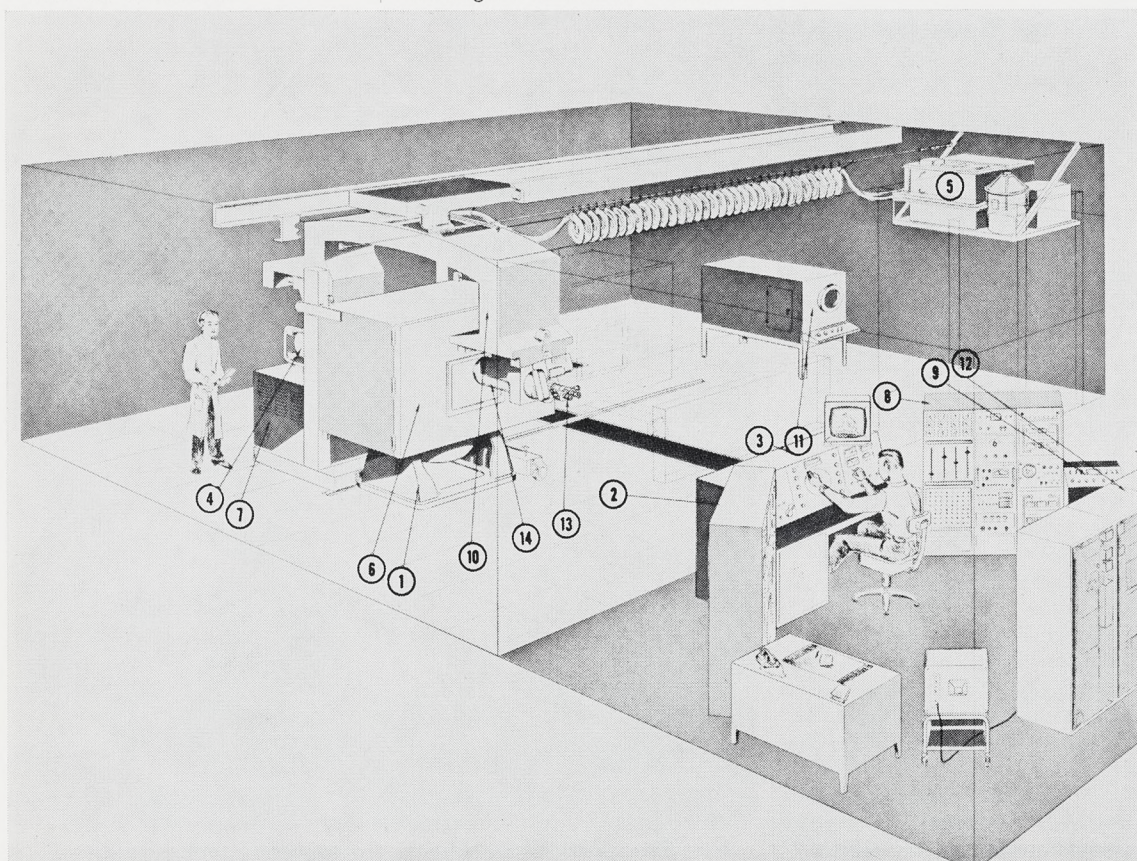
CONTROL ROOM — Roy Wolford, project coordinator, and Mr. Bickal put the system controls through shakedown paces. Here they adjust input to vibration exciter. At right are charts that record complete history of temperature and altitude during test. TV monitor is on console at right. Window looks into testroom.



SHAKER — Mr. Wolford checks 20-inch lift clearance between vibration exciter and test chamber, a feature provided so that the two pieces may be used separately. Exciter is capable of 5—5000 cps.



VIDEO — Video tape recorder is illustrated by Mr. Highland. A test program can be played back immediately, or sections of the run could be isolated and studied at will of operator. At right is TV tuner.



AS THE ARTIST SEES THE SYSTEM—Two-room view, testroom, and control room, shows design layout of the laboratory. (1) Vibration exciter; (2) random control console; (3) power amplifier, sine, TV and yoke controls; (4) strobed X-ray; (5) X-ray power package; (6) test simulator; (7) conditioning package for simulator; (8) simulator control console; (9) X-ray control console; (10) programmed and remote systems yoke assembly; (11) fluoroscopic observation chamber; (12) TV image recorder; (13) TV camera and optical system; and (14) image intensifier.

Jim Osgood Came To Work at Norair

"Jim Osgood came to work at Northrop Norair today."

This is a simple statement, but I wonder how many of you realize the ramifications involved in supplying manpower for a large corporation.

There are various means of recruiting personnel and we have at one time or another utilized every conceivable resource. The type of skills required and the volume determines the extent of our recruitment programs. During the past year we have been faced with the procurement of a great number of specialists, technicians, engineers and other skilled personnel—in a word, the

By Dave Stadler

same type of manpower every other company in the aerospace industry is seeking.

How do we obtain this manpower?

First we attempt to fill the existing openings from either qualified "in-plant" personnel or by recalling our former personnel.

We then scrutinize applications and resumes which we have skill-coded and filed, applications which were either mailed in, or completed by "walk-in" applicants; and those referred by you—all your relatives and acquaintances—and mine. We extend offers to those qualified.

Having exhausted the immediate supply of applications, we turn to outside sources:

We furnish daily listings to all Department of Employment offices in the area. We maintain weekly contacts with companies for the referral of their surplus personnel. We utilize the placement services afforded by trade and technical institutions, and reputable private employment agencies. We enlist the help of currently employed personnel, and pay an award to those who refer qualified applicants in specified job categories. During the past year, 81 of these awards were paid, and by the way, referrals have pleasantly proved to be our most productive recruitment source.

An extensive advertising program is carried on in local papers, in trade magazines and on our transportation vehicles.

We visit colleges in the local area and throughout the country, interviewing graduate students. Our recruiters travelled more than 64,580 miles in 1962 visiting 35 colleges.

This is but the start of a chain of events which eventually supply the needed manpower.

"Jim Osgood," our new hire, is fictitious but he is representative of the hundreds of new faces that come to Broadway and Prairie. His first contact is with the Personnel staff and we have a special responsibility—to create a favorable impression of the Company and to provide an insight into the policies, principles and procedures which will aid and protect him during his period of employment.

"Jim" is informed of our retirement and group insurance programs (if he could only know that approximately 11,573 health and accident claims and 41 death claims were processed last year, he would not hesitate to subscribe to the maximum allowable cover-

age). He is also encouraged to participate in Company-sponsored thrift programs — U.S. Savings Bonds, Salaried Employees' Savings Plan and Credit Union deposits — all conveniently handled through payroll deduction.

He also passes a physical examination. If there are limitations, handicaps in any way, this is noted and his assignments are selected accordingly. Both he and the Company are thus assured of his physical fitness for the job. He receives a badge and identification card, and commences a new era in his life.

As "Jim" progresses from day to day, he will make other important discoveries.

He will find that we are interested in him as an individual; that we respect his traits and his troubles, recognize his anniversaries, the glad and sad times in his life, and through every possible means endeavor to make him feel that he is an important member of the Northrop team.

If he believes that his talents may be utilized to a greater advantage in another plant area, he is urged to seek the help of Personnel in arranging a transfer. If he finds that he is in need of additional training and education, he may be encouraged to avail himself of several plans which will enhance his chances for advancement.

If he becomes disabled, or if compelling personal reasons demand his immediate attention, Personnel will assist him in arranging for a leave of absence.

"Jim" will be asked to use his ingenuity, to create new and useful ideas relating to his job so that he may be eligible for awards under the Suggestion Award Plan. In the past 12 months, awards totaling \$15,221 were paid to Norair personnel.

He should also know that his seniority status, eligibility for layoff benefits—if hourly rated, and retirement benefits, are based on length of Company service; that his rights to such benefits are protected through records maintained in Personnel.

When I see an applicant processed through our hire procedures, I frequently ponder on what the future holds for him. Will he meet all of his objectives here at Northrop. Will he be here 5, 10, or 20 years from now. Will he be the one who discovers, designs, develops, or helps produce a new and revolutionary product which will make the name of Northrop long-remembered in this wondrous age of ours.

But whatever the measure of success, I hope "Jim Osgood" never loses his enthusiasm for the Company, its products, policies; and above all, the Northrop human relations principle—that of really being interested in the welfare of all our people.

Northrop Norair News

VOL. 21

NO. 4

1001 E. Broadway, Hawthorne, Calif.
A NORTHROP CORPORATION
PUBLICATION
NORAIR DIVISION
Published every other Wednesday
CHARLES BRADFORD, Editor

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MOON RANGER PROGRAM WORK AWARDED NORTHROP BY NASA

The National Aeronautics and Space Administration has assigned important responsibilities in connection with the Ranger program to Northrop, it has been announced by Dr. Wm. F. Ballhaus, Corporation executive vice-president.

The system aspects of this work will be handled by the Corporation through Northrop Space Laboratories. Northrop Norair has for some time been engaged in subsystem and equipment work on the Ranger program and these will continue as part of Northrop's total assignment.

Following is the text of an announcement issued by NASA:

"The Northrop Corporation has been selected by the Na-

tional Aeronautics and Space Administration to provide additional industrial support to the Jet Propulsion Laboratory, Pasadena, on the Ranger program.

"This contract will be awarded relative to Rangers to be launched through the end of 1964. Northrop will assist JPL in design review, reliability studies, system testing, checkout, and spacecraft launch operating sup-

port. These tasks will begin March 11.

"It is contemplated that Northrop later may be assigned a complete spacecraft system responsibility for the Ranger program in a Phase II effort beginning with Rangers to be launched in 1965. This includes fabrication, assembly, checkout testing, and spacecraft launch operations. JPL will retain the major project management.

"The contract with Northrop will be negotiated by JPL and will be financed out of Ranger program funds. It is estimated that the cost of the first phase will exceed two million dollars. The total cost of the contract, including the Phase II effort, will be dependent on the decision as to the scope of work performed by Northrop if it is selected for Phase II.

"Ranger's mission is to obtain information about the surface of the moon, both for the scientific functions and in support of the national effort to land a man on the moon by 1970.

"Two of the Ranger's most important subsystems, the attitude control and the control computer and sequencer, are under contract to Northrop. NASA has decided that because of Northrop's previous work on Ranger subsystems, it is in the best position to undertake the very difficult task of assuming responsibility for an important position in a rapidly progressing program with minimum disruptions and loss of time.

"Present plans call for launch of the next Ranger spacecraft toward the end of 1963."

and from Manufacturing's Facilities Design and Construction, J. C. Gillibrand, superintendent; and Sheet Metal shop, Wayne Morrison, general foreman.

Next scheduled banks are: Night shift operations, March 18, Product Display Building from 4:30 to 9:30 p.m.

Day shift, May 22, Product Display Building from 7:30 a.m. to 12 noon.

Blood Bank Scheduled March 18

Northrop blood bank between December 1, 1962 and February 1, 1963 supplied 120 pints of blood for four members of the Northrop family. Open-heart surgeries were performed. There was no delay. The required units of blood had been previously deposited with the Red Cross by Northrop personnel.

Regrettably, only two of the surgeries were successful. But the two persons who are back at work are eternally grateful to those who made the blood possible.

One of the most powerful arguments for Company personnel blood bank is the fact that all types of blood can be obtained including the rare and unusual categories. The entire Red Cross stands ready to serve from their blood stocks in case of need.

On Wednesday, February 27, 304 Northrop personnel appeared as donors at the blood bank at the NRC Clubhouse. Two hundred seventy-two pints of blood were collected. This amount is an increase over and above the last bank, November 28, but there is still not enough blood to meet requirements.

Personnel areas showing the largest donor participation this time were from Technical (Welko Gasich, vice-president and assistant general manager was a donor); from Quality Control;

MAJOR DEAN TO NORTHROP A-F DEVELOPMENT

Major Julian A. Dean, jr. of Marquez, Tex., has assumed the position of chief development engineer in the Office of the Air Force Plant Representative at Northrop Corporation, it has been announced. He previously was stationed at Kelly AFB, Tex.

DAVE STADLER

Dave Stadler, chief, Personnel, and a 21-year man is guest columnist for John B. Clark this issue.

He is president of the board of directors of the Hawthorne



Community Hospital, a member of the Personnel Managers Committee of the Los Angeles Chamber of Commerce, and a past director of P.I.R.A.

He served as secretary of the Northrop Management Club and is presently a member of the Northrop Credit Union Nominating Committee.

SCOUT OFFICERS MEET AT NORAIR FOR PLAN TALKS

Plans and goals for Centinela Valley Boy Scouts are scheduled to be revealed this evening at a 70-member Centinela District streamline meeting hosted by Norair.

The meeting, certain to add new impetus to scouting, is the first full committee session to be held in the last eight years, according to John Warnick, District executive.

Tom McCarthy, Norair manager, Administration, and BSA District vice-chairman, will welcome the Executive and Operating Committee on behalf of Norair. Marshall Brough, manager, Sears Roebuck-Inglewood, and District chairman will cite Centinela District program objectives and serve as meeting chairman.

Safety at Riverside



MATERIALS HANDLING SAFETY—Lee Johnson, Norair chief safety engineer, shown here center, participated in the 52nd Air Force-Industry Safety conference at Riverside. Sponsored by the Office of the Deputy Inspector General, U.S. Air Force, and closed to the public, the program attracted 200 delegates from across the nation. Photoed with Mr. Johnson during a break in the three-day meeting are from left, Hollie S. Adams, jr., Norair Aircraft and Missile Accident investigator and Colonel Will L. Tubbs (USAF ret.), former director of Ground Safety.

Computer Data Now Being Used in Materiel for Raw Stock Purchase

One of the first uses of the automated portion of Norair's Integrated Management Systems (IMS) program, that of using computer data as basis for purchase of T-38 and F-5 stock, is now in effect, it has been announced by Grant Macdonnell, Division treasurer.

In Materiel where the new method is in operation, Carl Hood, director, also expects to use computer-produced data to guide the Division in filling needs for purchased parts and offsite purchased items in the near future.

Usage of a mechanized materials control system is another step in the Division's long range plans to provide management with timely information leading to more efficient control. Subsequent applications in the Materiel area will be the mechanization of total requirements computation, inventory control, and related management reports.

Development of the ability to provide and use automated data

in Materiel comes as a result of team coordination of Dick Spring and Bill Pewitt of Materiel; Denney Lee, Norval Humphreys, and Bernie Slotnick of Information Processing; George Pond of Master Parts Listing; Frank Guite of Internal Audit; and Keith Robinett, Bill Meyer, jr., and Herb Conzen of Business Systems Engineering.

Another phase of IMS, the Automated Master Parts List Subsystem (AMPLS) has been under development for several years. During the last year, AMPLS has had high priority with concentrated implementation effort amounting to some 90 hours of 7090 computer checkout time and 200 man-months of effort. AMPLS is not yet complete in that many of the uses for its major magnetic tape files remain to be developed and integrated.

In addition to uses described for Materiel, computer-extracted data based on AMPLS will be used in Logistics, Engineering, Production Planning and Cost

Estimating.

Integrated Management Systems, when complete, will be composed of a selection of inter-related major management tools, each contributing to the Division's competitive position.

Five of the systems, some now working, others proposed are defined as follows:

Master Parts List (now exists for T-38 and F-5):

A file maintained in the 7090 computer of released engineering drawing parts requirements broken down in order to make the information available to all using departments. In addition, it will provide input for the Automated Materiel, Logistics, and Production Planning systems.

Automated Materiel System (partially in operation):

A system to combine Master Parts List with additional computer input to provide total materiel requirements and inventory status.

Automated Logistics System (being programmed):

A computer file of Logistics and Engineering data recorded so that any or all may be extracted, massaged, and printed to meet Logistics requirements. This file will be used in connection with the MPL to provide required data. It will automatically or on call provide Logistics reports required by customers.

Automated Production Planning System (proposed):

A proposed program designed to utilize outputs of Master Parts Listing/Automated Materiel System and information presently in AOC files, plus additional inputs from Production Planning to provide automated production planning paper.

Automated Operations Control (in operation):

A system providing management with daily information as to performance as well as location of and status of fabricated items. It will be expanded in the future to collect labor costs, improve shopload forecasts, and to cover tooling and assembly.

CLASS UNDERWAY IN E-Z SPEEDY SHORTHAND

Personnel Activities, Charles Boyle, chief, in cooperation with Norair Industrial Training has announced that a class in E-Z Speedy shorthand will be presented in a 10-week series of meetings beginning Monday, March 18.

Location of the classes is the Plant One cafeteria, Mondays and Thursdays, 5:15 to 7:15 p.m. Cost for the complete series is \$3 a person to cover cost of textbooks and material.

All those wishing to enroll can do so at Norair Personnel Activities, extension 2784; Nortronics Personnel Activities, Plant Two, extension 506, and Nortronics Personnel office, Palos Verdes, extension 444. Reservations will be on a first-come-first-served basis.

E-Z Speedy shorthand teaches fundamentals to provide the student with a solid foundation for all types of dictation requirements. Previous shorthand knowledge is not required. E-Z Speedy is an entirely new and simplified shorthand system.

Night Shift Team Saves Machine Time on T-38

A Manufacturing night shift team composed of Bob B. Tompkins, assistant general foreman, Machine Operations; Larry Smith, foreman, Numerical Control; and Garvice Tate, profile machinist, have contributed significantly to the efficiency of the T-38 and F-5 programs, it has been announced by Jack Manion, manager, Manufacturing. The achievement was scored through a resequence of machine methods for a bulkhead former, left and right, in the airplane's inlet duct system.

A total of eight operations have been eliminated for this part plus the possibility that other formers can benefit from the same new shortened method.

Originally the formers were machined from 1.250" plate Dural, by (1) facing one side, (2) facing the other side, (3) machine to width to fit drill fixture, (4) drill for tooling index, (5) rough saw, (6) to the K&T N-C profilers for roughing inside and outside, M/L and pockets, (7) to the mill for machine cleanup, (8) thickness dimension, (9) return to K&T for finish complete of tops of flanges, pockets, and (10) M/L.

A trial check by Mr. Smith and Mr. Tate revealed that warpage, part of the motivation for using stock .250" thicker than the finished part, did not occur during the early roughing passes, and the first three operations plus rough sawing were dropped, the material starting at 1.125".

The fact that stress-relieved plate was being used made this possible.

After additional review by Mr. Tompkins who suggested 1.000" plate, the finished dimension was tried, eliminating four more mill operations. And the material is now ordered to specified width.

This left two operations, (1) drill index holes, and (2) to the K&T for rough and finish without removing from the machine.

Savings generated by the team of Tompkins, Smith, and Tate amount to 12 hours a setup run, equaling 1.38 hours a part, plus of course conservation of the difference between 1.250" and 1.000" stock.

SPARTAN GRADS INVITED BACK TO TULSA

Are you a Spartan grad? Spartan School of Aeronautics down Oklahoma way?

If so, the Spartan Alumni and Employees Association would like to get in touch, reason being one and all are invited back to Tulsa for the annual reunion, June 8, 1963.

Over 30,000 folk have passed through school portals and are now scattered freely through the aerospace world. Norair has its share. Take heed. A big crowd and a big time awaits.

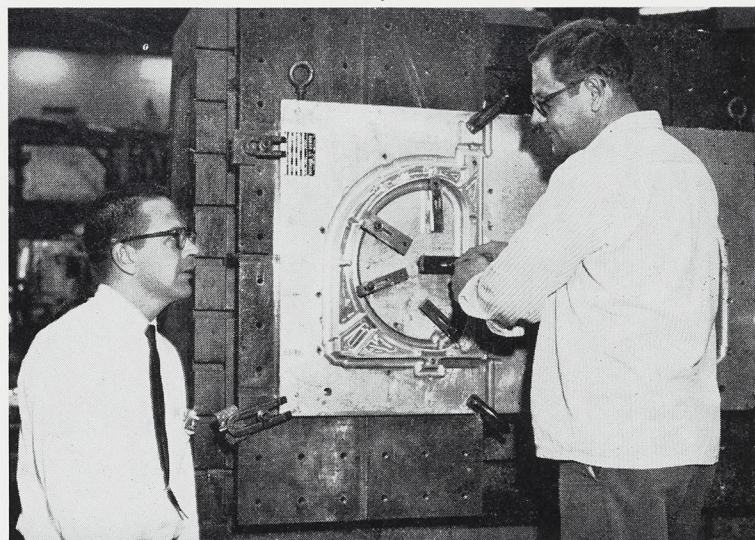
Write Spartan School Alumni Association, P.O. Box 8278, Tulsa 15, Oklahoma, if you can make it.



AIR FORCE SERVICE PINS—Major Everett W. Seath, Quality Control division chief, USAF Plant Representative office, presents 10-year service pins to Jack Laird, Air Force Quality Control Electronics and Mearle DuHamel, secretary to the major. Mr. Laird has a total of 16 Air Force and Navy years counting wartime and civil service. Miss DuHamel has 10 years. Major Seath's gold oak leaves are brand new. He was elevated to this rank just recently.



SPACE MEN—No! They are five students who recently completed a training course in the application of an anti-fungus compound to the interior surface of Boeing wings. The course included surface preparations, application, repair and safety procedures. Instructor was Harry Pouncey, Education and Training group. Students are from left, standing, Ray Beye, Edgar Fennell, and Tom Alderson. In foreground, Wayne Aaron and Patrick Vasquez.



EIGHT STEPS SHORTER—Night shift's Assistant General Foreman Bob Tompkins and Larry Smith, foreman, Numerical Control, check for part warpage after establishing new sequence for T-38—F-5 bulkhead former. There is no warpage. Part, even after eliminating eight machine steps, holds to less than .010.



LET THE K&T DO IT—Mr. Smith and Garvice Tate, profile machinist, review new numerical control setup for bulkhead former. Team cut 12 hours per setup run, equal to 1 hour 23 minutes a part. Conservation benefited by using 1-inch instead of 1 1/4-inch stock. Other formers are being studied for application of technique. (See story.)



RIDES WANTED

7 a.m. — 3:45 p.m.

FRANKLIN & VAN NESS, Hollywood. Tom Kovich, ext. 2568, 2569, HO 2-4557.

LA PALMA & BROOKHURST, Anaheim. George Johnston, ext. 1424, KE 5-6363.

7:30 a.m. — 4:15 p.m.

HAWTHORNE & LENNOX BLVDs., Lennox. Carol Taylor, ext. 2604, OR 2-1881.

RAMBLA PACIFICO & PACIFIC COAST HWY., Malibu. C. W. McQueen, ext. 4281.

8 a.m. — 4:45 p.m.

MOODY & CRESCENT, Cypress. Floy Dean Shupenko, ext. 2123, JA 7-3535.

NORMANDIE & 125TH ST., Los Angeles. Darlene Becktel, ext. 2123, 754-2066.

LENNOX & PRAIRIE OR HAWTHORNE. Lennox. Ann L. Gaines, ext. 2454, 671-8719.

PRAIRIE & 176TH ST., Torrance. Need ride home. George W. Schmitt, ext. 1611, DA 9-5364.

HOOVER & MELROSE, Los Angeles. James Low, ext. 1676.

4:45 p.m. — 1:15 a.m.

HAWTHORNE BLVD. & 190TH ST., Redondo Beach. Rachel Ann Pluth, ext. 2123, 371-5782.

RIDES OFFERED

7:30 a.m. — 4:15 p.m.

RAMBLA PACIFICO & PACIFIC COAST HWY., Malibu. C. W. McQueen, ext. 4281.

8 a.m. — 4:45 p.m.

HOOVER & MELROSE, Los Angeles. James Low, ext. 1676.

CRENSHAW & 82ND ST., Inglewood. 2 bks. off Manchester, Charlotte Woolums, ext. 2151, PL 3-7484.

BBSF Classified Ads

BBSF classified ad service is provided free of charge to all Northrop Norair personnel.

Ads for agencies, commercial enterprises and private businesses are not accepted.

Deadline is noon Wednesday, one week before publication.

FOR SALE

OLDSMOBILE, 1954, 4-dr., factory air-conditioning, p/steering & brakes, 1963 plates, good transportation. \$395; Plymouth, 1956, V-8, stick-shift with o/drive, 280 cu. in., new tires, 1963 plates, r/h, \$695. PL 8-9182.

RANGE, GE, elec., dble. oven, auto. controls, push-button burner controls, high broiler, \$45; pool table, 8', 1-yr-old, orig. cost \$100. \$50. 831-9707.

MERCURY, Montclair, 1955, orig. owner, r/h, white side walls, \$450. FR 5-3261.

HOUSE TRAILER, 16' Terry, side dinette, toilet, awning, elec. brakes, sleeps 6, new paint, many extras, \$850. AX 3-1492.

REFRIGERATOR, 12 cu. ft., gas Servel, 40-lb. cap. freezer section, \$80. FR 4-8036 after 5 p.m.

CAMERA, German AGFA Ambi Sillette w/case, detachable 50-mm lens, BEWI lite meter, AGFA flash attachment, haze filter, \$45. DA 9-3979 after 6 p.m.

UTILITY TRAILER, 2-wheeled, 1963 license, \$60; double spring & mattress, \$10. OS 5-2159.

PLYMOUTH, Custom Suburban station wagon, 1959, power steering & brakes, r/h, air cond., new tires, \$1350. DA 9-6607 after 5 p.m.

CAMERA, motion picture, Kodak-Brownie, 8mm auto., No. 142 F/2.7, \$25. OR 7-2621.

REFRIGERATOR, Philco, \$60; washer, GE Filter Flo, \$40. OS 5-6819.

PONTIAC, Star Chief, 1957, convertible, w/all extras & power, motor and trans. recently o/hailed, \$750. VE 8-7846 after 5 p.m.

DODGE, station wagon, 1957, r/h, auto. trans., navyblue upholstery, \$595. Box 401.

STUDEBAKER, Silver Hawk 1958, auto. trans., power steering & brakes, new tires, 35,000 miles, \$750; motorcycle, lightweight, 3-spd. trans., 250 miles, \$100. 379-9408.

AUSTIN HEALEY 100-6, 1957, \$1295. 371-9673.

CHEVROLET, V-8, 1959, 2-dr. Biscayne, r/h, new w/w tires, auto. trans., \$895. DA 9-6923.

LAMPS, 1 pr., milk glass, maple base, w/shades, \$10. 324-1016.

FOR SALE

HILLMAN, Minx, 1958, 4-dr. deluxe sedan, r/h, 1963 license, \$350. FR 7-2489.

1/2 ACRE, 2 houses, other buildings, fenced, walking distance to Norair, reasonable down pymt. \$39,500. OS 6-5253.

TV, Admiral, 17" table model, completely o/hailed, \$30; TV tray & chair, child's, metal, \$2.50; shampoo tray, larae, hvy. cast iron, porcelain-coated pastel green, w/plumbing fittings including spray, \$25. OS 6-9989.

WASHING MACHINE, Kenmore wringer-type, used 6 mo., \$45. 672-4725.

WASHER-DRYER COMB., O'Keefe & Merritt, needs new gear box, \$100. OS 5-1347 after 5 p.m. & weekends.

BOAT, 15' sport fisherman, homemade, w/cabin, Johnson 30 hp motor, portable bait tank, trailer w/normal size wheels, \$600. 371-9730.

HOME, Grandview Palos Verdes, 4-bdrm., 2 baths, family room, carpets, drapes, GI loan, \$39,800. FR 7-4019.

CABIN CRUISER, 16', plywood & alased, bait tank, ski ropes, 8 life preservers, lights, 2 30-hp Mercury motors, trailer, \$750; Ranchero, 1959, new paint, \$1150; surfboard, 8' 6" Bina, \$85. DA 4-6203.

VOLKSWAGEN, 1962, white, new tires, radio, \$1650. EX 8-9918.

CADILLAC, coupe 1954, all power, new tires, \$550; Ford, roadster, 1932, full race 1946 Mercury eng, daag front end, 1939 Mercury rear end, 3-54, outside chrome headers, full hyds, filled deck, lowered hood, Stewart-Warner instr., \$950. PL 4-7861.

HOUSE, R-4 lot, 2-bdrm., tile bath w/shower, Formica kitchen, garbae disposal, new auto, washer, 2-car garage, 6 mins. from Northrop, sell completely furn., \$15,950; drill press, Delta industrial model w/foot feed, \$125. PL 5-9481.

WASHER, GE Filter Flo, auto., working cond., \$17.50; tires, 7.50x14, tubeless, w/w, \$2.50 ea., \$8 set of 4. FR 8-2810.

MINI-BIKE, Go-Kart Scrambler, new Clinton 7.5 hp chain saw motor, candy apple paint, \$150; base ball shoes, Little League, size 5 1/2, \$3.50; bicycle, girl's, 20", \$15. PL 5-4497.

DESK, charcoal, w/nevermar top, 5 drawers, costs \$35. \$20. OS 6-0749.

TWIN BEDS, inner springs & mattresses, \$30; light fixture, lae, crossed oxen yokes, \$10; golf cart, never used, \$8; backpackers frame & bag, GI, \$5. GE 1-4233.

RUG, 12'x15', wool, & pad, used 1-mo., cost \$179. \$100. OS 5-4555.

HOUSE, Morningside Park 2-bdrm., lae, family room, dble. fireplace, covered patio attached, carpeting & drapes, corner lot 63x135, submit on down, \$23,900; time switch, General Controls, elec., \$10; ladder, 6' comb., \$3; power mower, reel-type, \$25; garden hose, 50' \$2.50; edger, elec., \$5; sweeper, \$8; garden sprayer, tank-type, \$3; storage trunk, \$3; tropical plants in containers, garden tools & plant food, 25¢-\$2. PL 7-6973.

TIRES, 4, 8.20x15, tubeless, \$20 ea. 676-5754.

FORD, Fairlane 500 1957, 2-dr., auto. trans., power steering, r/h, w/w nylon tires, navyblue interior, 1963 plates, \$699. DA 4-5824.

RUG, 9'x12', beige, wool, mothproof, w/pad, used 6 mos., \$35. AX 5-9056.

VOLKSWAGEN, deluxe, 1957, w/radio & new brakes, \$750. CR 6-3534.

CHEVROLET, 1958, Bel-Air, 4-dr., h/top, p/s, r/h, w/w new battery & brakes, orig. owner, \$825; movie camera, Bell & Howell, 8mm, lite bar, projector w/roll down screen, cost \$175, \$110; desks, 2, maple, 3-dwr., drop leaf, \$27.50; bookshelves, 2, walnut, 2-shelf, \$10 ea.; bookshelf, maple, 3-shelf, \$7.50; twin beds, walnut, springs, night stand, chest & vanity, \$42.50; TV chair, rocker-type, upholstered, \$12.50; tables, 2, round, glass-top, \$5; small, maple, \$5; air conditioner, larae, 1-H window-type, Chrysler, \$150. GE 9-0658 days.

METRO, 1960, h/top, \$799; service porch sink, \$10; car cooler, Reaol, \$15; tire chains, new, \$8; oxy. & acety. equip., burn & weld, \$87.50; jet pump, 1 hp, deep well & 50' plastic pipe, \$87.50; at. canning jars & lids, \$1.25 a doz. VE 7-4237.

CLUB CHAIR, reclining-type, w/disappearing headrest, ivory navyblue, \$40. OR 7-6604.

OLDSMOBILE, Dynamic 88, 1960, 4-dr. h/top, power steering & brakes r/h, 1963 license, \$1750. EX 6-6823.

ENGLISH FORD, Consul, 1957, 5 pass., 4-dr. sedan, 23 mpa, r/h, 30,000 miles, good tires, new brakes & battery, \$295. GE 0-1245.

CHEVROLET 409, 1963, 425 hp, 456 rear end 4-spd. trans., Enalewood slicks, dual quads, super sport Impala, 3100 miles, \$3000. FR 2-3920.

DODGE station wagon, 1957, 2-dr., \$575. GE 1-5489.

SEWING MACHINE, Necchi, 3-mo-old, cost \$389. \$250 PL 3-0500.

CRIB & MATTRESS, Babyline Deluxe, \$20. 371-9697.

CAMERA, Yashi-Mat Reflex, w/case flash gun & bag, value \$145, \$50; golf clubs, Spaulding Autoograph, 1 set, bag, Bag Boy cart, \$50. 639-2882 after 6 p.m.

MG TD, 1951, new paint & runs good, \$495. 867-1476.

FORD, 1951, 2-dr., good transportation, \$90. ST 0-8177.



ANOTHER NRC TRIUMPH DUE—The NRC Gem and Mineral Club is now planning its 4th annual Galaxie of Gems show to take place Saturday and Sunday, March 30 and 31. Here the show committee, from left, composed of Howard Converse, G and M commissioner; Lyle Claypool, committee chairman; Frank Matthews, show manager; and committee chairmen Mike Michaels, Frank Bowes, and Rex Russell review arrangements to accommodate over 80 gem and mineral collections. Exhibits will be entered by private individuals, dealers, and other gem and mineral societies. Last year over 3000 persons attended. Show location is the Product Display Building. Hours, Saturday, 10 a.m. to 10 p.m. Sunday, 10 a.m. to 6 p.m. Admission is free. All are welcome.

ADMIRAL LAYTON SENDS JAPANESE STAMPS TO NRC

Admiral Edwin T. Layton (USN ret.), Northrop representative for the Far East, prompted by a recent Stamp Club story in the Northrop Norair News sends greetings and a beautiful assortment of Japanese stamps to the Club.

Great interest was shown by Club members during an inspection and discussion session last meeting over the unusual collection.

Admiral Layton's thoughtfulness was sincerely appreciated and all NRC stamp people extend to him their very best.

Club Commissioner Claude Pike now wonders if stamp liaison can be established with other Northrop representatives from the far capitals of the world.

FOR SALE

MOTORCYCLE, custom 46 Harley, 74 bored & stroked 80 & 3 & quarter-inch pistons, special XA front fork, hand clutch, foot shift, all parts chromed, \$600; shoe roller skates, girl's, size 5 1/2, boy's, size 7, each w/case, \$6 ea. DA 4-5774 after 6 p.m.

WANTED TO BUY

CEMENT MIXER, gas or elec.; wheelbarrow, contractor-type. 697-3328.

BICYCLE, boy's, 20" or 24", reasonably priced. FR 9-4517 eveninas.

PORT-O-CRIB, infant's, used. OS 6-7820.

FOR TRADE

.45 A.C.P., brass, once-fired, trade for .38 Spec. or .357 Maunum brass. FR 5-8804.

RENTALS OFFERED

APT., 2-bdrm., unfurn., larae closets, next to park w/pool, 20 minutes from Norair, \$70 mo. GA 4-0590.

DUPLEX, furn., lower, 3-bdrm., Playa Del Rey, \$175. OR 1-5267, OR 1-4845.

APT., children & pets OK, range & refrigerator available, fenced yard, larae patio, paved parking area, on bus line, Rosecrans near Aviation, \$70 mo. OS 5-1123.

APT., bachelor-type, bath, kitchen, combination living & bedroom, furn., no children, no pets, \$20 clean-up fee, \$60 mo. 370-2663 after 6 p.m. & Saturdays.

SUMMER RENTAL, Bass Lake, 1-min. walk to lake, 5-min. walk to village, 1 family, \$125 week, 2 families, \$150 week. 645-1274.

RENTALS WANTED

HOUSE, 3-bdrm. Palos Verdes area. FR 7-3487.

PERSONALS

SINCERE APPRECIATION for the expressions of sympathy & kindness during the loss of my brother. ESTELLE STACY.

Mrs. Fred Briscoe Named "Queen" Gets Mink Stole, Maid Service

Mrs. Fred Briscoe (Fred is Norair Personnel man) was chosen for top honor on last week's special aerospace edition of Jack Bailey's ABC Queen for a Day show.

Mrs. Briscoe, mother of nine little Briscoes, Fred, Diane, James, Kathryn, Johnny, Dick,

Susan, Gregg and Kevin, had asked for bunk beds and a new stove.

These she received, plus many other prizes including a mink stole, maid service for a week, 25,000 S&H Green Stamps, a dinette set, a Hava Java coffee butler with a supply of Folger's coffee, a Helbro's watch, a World Book encyclopedia, Speed Queen washer and dryer, Spiegel gift certificate, a clock, a bedroom suite, a television set, and a trip for her husband and herself to the Executive House in Scottsdale, Arizona.

GILMAN IS NEXT FOR NRC GOLF, TEE TIME 9:30

Next Saturday, March 16, the NRC Golf Club, Tom Williams, commissioner, will convene at number one tee, Gilman Hot Springs, for a round of tournament golf.

Starting time is 9:30 a.m. with a limit of 20 foursomes. Green fee including prize fund totals \$4.



WHERE TODAY IS TOMORROW—Northrop folk on their "Gadabout" way through the Far East during recent NRC Orient tour were guests at the beautiful Tokyo home of Admiral and Mrs. E. T. Layton (USN, ret.), Northrop representative in that theatre. From left are (seated) Daniella Pernet, Ruth Cleophas, Vonda Ervin, Jeanne Andrecht, Karoll Shurtz, Rosema Sheblak, and Helen Gungle. From left, standing, Mrs. Layton, Admiral Layton, Lloyd Cleophas, Dr. Vernon Sheblak, Roy Pernet, Maude Bisho, Ray Thielen, and Burl Ervin. Divisions represented were Norair, Nortronics ES&E and SSD, and Northrop International. The tour, 28 days by jet, took the group to Formosa, Hong Kong, the Philippines and Hawaii, in addition to Japan. For story on Admiral Layton's NRC Stamp Club interest, see above.



Northrop Norair News

Issued biweekly by Norair Division of Northrop Corporation • Wednesday, March 27, 1963

HAWTHORNE, EDWARDS AFB, PALMDALE

SAN ANTONIO, EL PASO

Charley Boyle

DESIGNER IN THE HUMANITIES

People of Northrop Corporation and the Centinela Valley community are saddened by the death of Charley Boyle, Norair chief, Personnel Activities.

Charley, who received his 20-year pin last year, came to work at Northrop at the very height of the war effort. He hired in as floorman and expeditor in Production Control, working first at Hawthorne then at the Olympic plant.

He liked Northrop and when the war was over, he stayed.

Being trained in "show business," the theatre and theatrical production, polished in manner and speech from the years in his trade, Charley immediately gravitated to the nearest thing at Northrop, Personnel Activities.

Personnel Activities was new to aerospace, new in fact to all industry. Entrepreneur and architect of the small department was John B. Clark, director, Industrial Relations and Charley quickly became Mr. Clark's right hand in building the morale

By Aerospace Reporter

of the Northrop working force, a morale struck dangerously low by the staccato disasters of Pearl Harbor, Manila, Corregidor.

Charley's concepts and influences played a major role in shaping the destinies of Northrop's personnel programs. Witness Personnel Activities and the Northrop Recreation Club with which he was directly concerned, plus valuable assistance to others, the Northrop Management Club, design and purchase of service pins, cafeteria decor, Company indoctrination programs.

His counsel was highly valued and was always sought in many of the policies regarding the Northrop Norair News. He was to have been guest columnist for Mr. Clark in an early issue.

Charley was a "show business" paradox. When it came to serving people he was utterly selfless. What would be a triumph and top billing for other men "of the boards" was only a day's work to him. And he had many such day's work.

What were his triumphs? Seen from so many eyes?

The most spectacular might have been the NRC Victory Mardi Gras for the war wounded of Birmingham Hospital. It was held at the Shrine Auditorium and thousands were there to see "Mr. High Noon." Gary Cooper, crown Margie Rinewald queen. Margie worked in Materiel.

Charley's greatest professional triumph could have been the Wing Dings minstrel series put on several years running under the NRC banner at Leuzinger High School with four or five hundred Northrop people playing the parts.

His most sustained triumphs were probably the Savings Bond drives. There were seven "loans" during the war and at least one each year since. The millions of dollars invested in government securities by Northrop people has surely earned him a broad niche of respect.

What about the blood bank? This certainly belongs to Charley as a triumph of mercy. Countless fellow workers who benefited in time of illness will so testify.

AID and Nor-Aid, the Adopted Family program, each which reflects his many facets of genius for human things, would be triumphs in charity.

How about family days and the hundreds of department parties over the years? Picnics and outings? The picnic kit was Charley's idea with baseballs, bats, gloves, balloons, and other game paraphernalia, inventoried to fit the crowd. A 50-people picnic got a 50-people kit. A 100-people picnic got a 100-people kit.

A triumph to be counted would certainly be the plant Christmas parties. With Santa being brought to Plant Four lawn via helicopter. The shining eyes of thousands of youngsters, say yes; this one certainly.

The list never ends.

Perhaps the greatest triumph scored by Charley Boyle is one so obvious that we Northrop co-workers of his, going about our duties and in the preoccupation of our busy days, have never stopped to recognize it, never give it name.

This triumph must be that the work of Charley Boyle, master draftsman in the humanities, lives after him, thriving and real.

The climate, the Company-employee relationship in which his artistry flourished, remains the same. A team of working people, "not cogs in an industrial machine, but individual human beings with ambition, intelligence and dignity" provides the fertile ground, a good earth which assures the perpetuity of the Charley Boyle design.

What greater triumph if a man's work lives?

JONES HOSTS FIRST MEETING IN FREEDOM BOND CAMPAIGN

First of two national aerospace-aircraft conferences with U.S. Treasury representatives, at request of Secretary Dillon, was hosted by Northrop Corporation President Thomas V. Jones in Los

Angeles last Thursday, March 21.

Appointed by the secretary of the Treasury as national chairman of the 1963 Freedom Bond Drive in the aerospace-aircraft industry, Mr. Jones arranged the meeting at the Los Angeles Country Club of leading executives of the industry firms headquartered in Southern California.

The meeting served to enroll top management support for start of an intensive drive designed to increase sales of United States Savings Bonds through the Payroll Savings Plan. This is regarded as a means of strengthening economy of the individual, community and nation; building the arsenal of freedom; resisting inroads of communism; fa-

cilitating management of the public debt.

Secretary Dillon was represented at the conference by R. Duane Saunders, director, Office of Debt Analysis, Washington, D.C., who detailed vital importance of the Savings Bonds to management of the public debt.

Mr. Jones reported to the industrialists on a conference called earlier this year in Washington and attended by 27 other industry chairmen.

Mr. Jones has scheduled a New York luncheon, similar to the Los Angeles meeting of March 21, for today, March 27. It will be attended by aerospace-aircraft industry leaders from eastern seaboard areas.

Laski Voted President Northrop M-C

The Northrop Management Club has announced election results of officers for 1963:

President, Ed Laski; vice-president, Leo M. Sacks; vice-president, nights, E. W. Underwood; secretary, Bill Jones; treasurer, Rudy W. Horwat; and sergeant-at-arms, Bill Schramm.

New president Laski, a 22-year man, is supervisor, Blueprint Control, Organization 5351. He served as chairman of the Club's Educational Tours committee last year, and was ticket chairman during the previous year.

Members of the Board of Control committee for 1963 were also announced.

Charters and Policy, ex-presidents Al Binsacca and Ed Nolan.

Planning committee, Leo Sacks; Programs, Wm. Brown; Facilities, Ed Seyfried.

Special committee, E. W. Underwood.

Events committee, Bill Jones; Publicity, Harry Blocher; Tickets, Ed Foord.

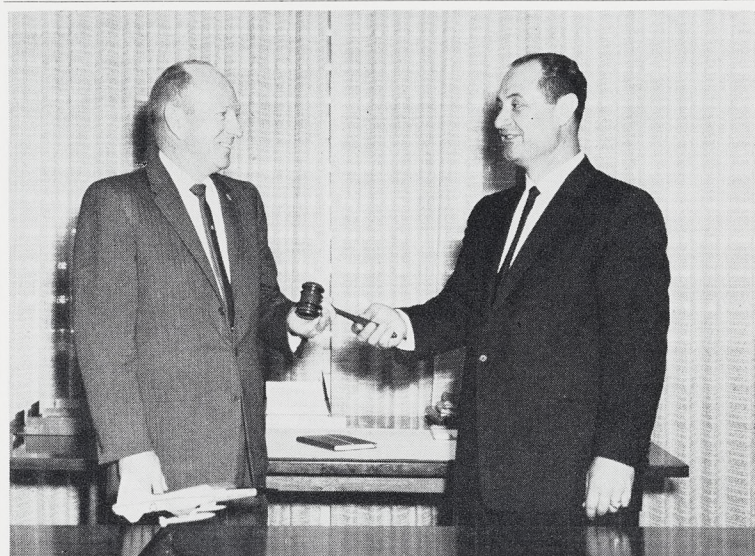
Fiscal committee, Rudy Horwat; Membership, Dona Page; Finance, Hugh Denny; Personnel, Louise Hobson.

Support committee, Bill Schramm; Forums, Leo Richmond; Tours, Ed McGrath; Junior Achievement, Tom Brazil and Rollie Pontious.

Millikan to Chairmanship, ANG Council

Brigadier General Willard W. Millikan, senior representative, Norair Division, Washington, D.C. and commander of District of Columbia's Air National Guard unit at Andrews Air Force Base, has accepted chairmanship of the Air National Guard Council of the Air Force Association. He chaired this same Council when it was first established in 1954.

The Council, made up of seven Guardsmen who are wing commanders or officers in equally responsible positions, develops recommendations for the AFA president on what the Association should be doing to help the Air Guard program.



GAVEL EXCHANGE—Time-honored ceremony for outgoing and incoming presidents of the Northrop Management Club took place last week in a traditional gavel exchange. Here 1963 president, Ed Laski, receives symbol of office, congratulations, and best wishes from his predecessor Al Binsacca. Installation night for 1963 officers will take place at a dinner meeting April 5 at the new Airport Marina Hotel.



IT'S OFFICIAL—First T-38 supersonic trainer to arrive at Reese Air Force Base was christened with champagne by Mrs. Jack Strong, wife of the mayor of Lubbock, Texas. Joining her in greeting the airplane is Colonel James A. Gunn III, Reese commander. Over 1500 people attended celebration. Welko Gasich, Norair vice-president and assistant general manager, Technical was featured speaker at Base luncheon. Events included an air show with two T-38s, a T-Bird and a Tweetie Bird, T-38 Operations movie and briefings by Colonel Roscoe B. Woodruff, jr., 3500th Pilot Training Group commander.

Ideas and Products

I consider it an honor and a pleasure to substitute for my good friend John Clark in authoring this column.

In my nearly 10 years as a member of the Northrop team, I have had many, many occasions to work with John and his good Industrial Relations people; here in Hawthorne, at Cape Canaveral and at Edwards. People like John make it easy to have a warmth for the people of Northrop and a real and sincere pride in being a part of this company.

When asked to contribute as guest columnist, I had mixed emotions. Being a journalist is not my "cup-of-tea." I am no

By Milt Kuska

journalist and have never had any suppressed desires of any sort to become one. Also I remember a wise man said, "Let thy speech be better than silence or be silent." Loosely interpreted, this means that if I don't write something interesting and worthwhile, I've wasted your time. Let us proceed.

IDEAS TRANSLATED

The "Technical" organizational segment of our Division encompasses Engineering, Marketing, and Customer Relations. We have the responsibility for providing the technical leadership and guidance for our future, the marketing of our concepts and ideas, of insuring a receptive atmosphere with our various customers, and last, but certainly not least, for the engineering know-how to translate ideas into producible and effective products.

We build, proudly I say this, some of the best airplanes in the world. Our T-38's and F-5's will be produced for several years to come. New versions of this airplane family provide a large future potential for sales to various old and new customers. The fruits of Dr. Werner Pfenniger's lifelong dedication to the reduction of airplane drag are now receiving worldwide attention as our X-21 airplanes for the demonstration of laminar flow control near completion. A major portion of our future business could be in the exploitation of this concept.

The products of today are the results of the creativity and ideas of individual Norair people. Our future more than ever depends on our "production of ideas."

THE PUBLIC EYE

Those of you who have been here as long as I have, have seen quite a transformation take place in our Company. This transformation is the result of planned progress. It has primarily been in the direction to permit better exploitation of our technologies and to provide an atmosphere in which people with ideas can nurture them into concepts and designs for future products. This transformation is evidenced in our organizational structure, the new "face" it presents here on Broadway in Hawthorne, in Palos Verdes, Anaheim, Conejo Valley, Massachusetts, etc., and its new "image" in the public eye. I read recently in California Business Review that the future success of companies will depend more and more on the efficiencies of their research and development laboratories. We believe this. I know you are aware of the new supersonic/hypersonic wind tunnel

that was completed last year. This provides us with one of the outstanding aerodynamics experimental "tools" in the aerospace industry. If you have had occasion to enter the plant through Gate 10, you have seen the new two-story structure just being completed. This is the first segment of a new research laboratory complex for our Division. In it will be housed laboratories with which our idea men and women will work to provide the breadth of technical ingenuity required for our continued progress.

Our products of the future will come from seeds that are sown and cultivated in these laboratories. In the years to come, you will see the addition of new buildings in the research complex that will house more labs and more creative minds which will be the backbone of the growth of our Division. But, all of these laboratories and the results of the experimentation done in them are no better than the quality of the brains behind them.

THE SPACE BETWEEN

We have many, many good people at Northrop but as all of you know technological advance is progressing at an almost fantastic rate. New weapons become obsolete before they can be put into production. New ideas must be recognized and exploited in a timely manner. Our technological brain power must not be allowed to gather dust. You have all read of the concern for the technically obsolescent man. We don't want that to happen here. We provide educational programs in an effort to keep it from happening. However, it takes the recognition and initiative of the individual to take advantage of these company-sponsored programs. It would help all of us to take a little inventory of how we are progressing compared to the world around us. In this era of astronauts and space exploration some of us might do well to contemplate a quotation I recall, "the biggest space problem is the one between our ears." If it is a problem then maybe we as individuals should do something about it. The Company will help.

In years past, many young engineers have asked me to give them advice as to how best they could progress in their professional life. I have had a ready answer; another quotation, "the best preparation for the future is the present well seen to, the last duty well done." This is still good advice, but to it I'd add the necessity for lifelong learning to keep current with our environment.

In closing, I want to take this opportunity to say, "hello" to my many good friends from the Cape Canaveral days, also at Edwards and even many here in the plant that I seldom have the good fortune of seeing.

Northrop Norair News

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Twenty-year Pins Presented



TWENTY-YEAR PINS—Seventeen more members of the Norair team meet with Corporate Vice-president and Norair General Manager Dick Nolan, seated center, to receive diamond-studded 20-year pins. From left, seated, they are Marie Wilson, Alice Miles, Ruth Harris, Pearl Hardacre, Mr. Nolan, Alice Valentine, Marie Louise Glass, Elizabeth Briggs. Standing, from left, John Edgar, Kenneth Cooper, Reid Coy, George Johnson, D. R. Reyes, Alfred Russell, John Lewis, Albert Throckmorton, Paul Nippert, and Eduardo Regalado. Mr. Nolan took the opportunity to discuss Division plans, aims and objectives and to reminisce about accomplishments of the past. Division 20-year pinholders have now passed the 800 mark.

MILT KUSKA

Milt Kuska, deputy assistant general manager, Technical, is guest columnist this issue for Mr. Clark.

"Milt" as he is known to his hundreds of friends at Norair is a 10-year man. It was he as program manager who launched the Division's X-21 Laminar Flow Control



program wherein Dr. Pfenniger's boundary layer theories are being applied to LFC demonstration airplanes with flight date due early next month.

Other important assignments for Mr. Kuska include chief missile flight test engineer for the Snark flight test program at Cape Canaveral and director, Flight and Laboratory Test during initial T-38 and N-156F programs at Edwards.

"NEW BIRD" IS BEST STORY IN A-F PRESS

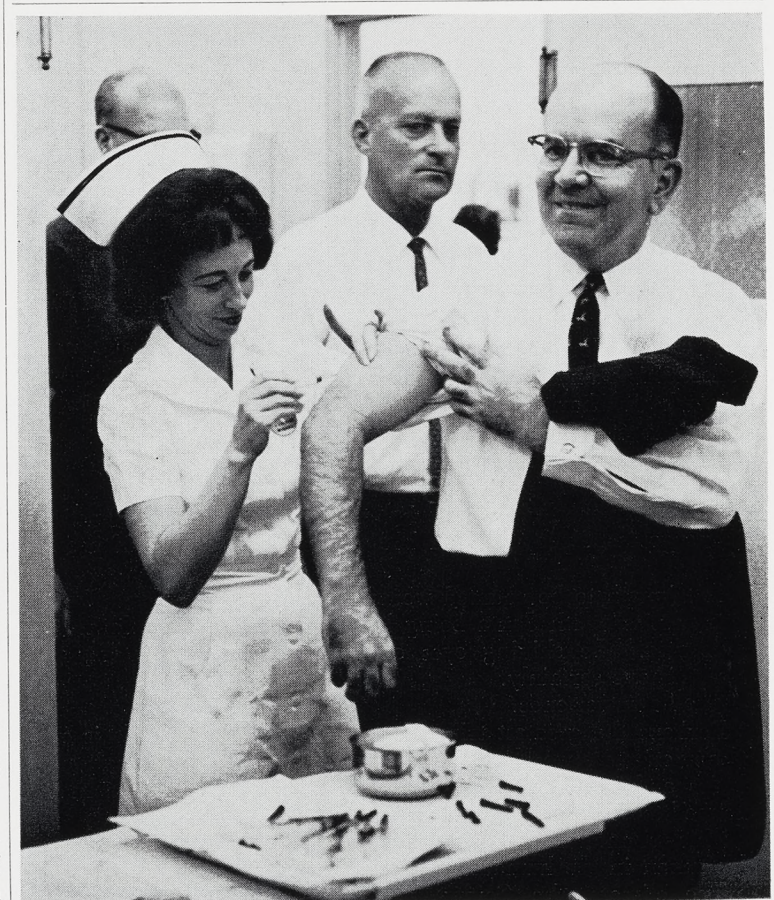
The feature story printed in February 13 issue of the Northrop Norair News entitled "New Bird For Reese" from "The Roundup" base newspaper and authored by Captain Richard W. Kimball, information officer, has just been judged the best feature written at any of the 28 Air Training Command bases during the last quarter of 1962.

Captain Kimball was presented with a Certificate of Merit from ATC. Presentation was by Colonel James A. Gunn III, Reese commander.

The winning feature story, in addition to being in the Northrop Norair News, was also republished in several Lubbock, Texas newspapers.



HONORS FOR THE TEAM—NRC Trap and Skeet teams copped first place in the recent National Industrial Recreation Association's competition held at San Diego. Here Don Greco, Personnel Activities, right, presents team trophies to Dick Cade, Gun Club commissioner and event coordinator; Bob Bagby, Trap and Skeet commissioner.



CAN TAKE IT—Dan O'Halloran, chief, Quality Control, waits for the needle during Company flu shot clinic. Nurse Melugin is officiating, while L. C. Cleophas dubiously waits his turn. Dr. Krebsbach, chief, Medical group, reports 2-month program for entire Northrop Corporation was highly successful. Over 14,000 injections were given to employees. No charge.

Norton Orientation Team Prepares T-38 for Tour

Norton Air Force Base's Orientation Group have phased down sharply another display assignment in their efforts to visually tell the Air Force story to the Free World.

When a call came from Edwards Air Force Base to Major Boyce J. Harper, jr., the group's commander, that a T-38 (ship 5101), used in the Air Force testing program was stressed out and no longer suitable for an operational role, a decision to take the aircraft for display purposes had to be made.

No hesitation. Affirmative.

Jack Farley, Northrop Norair Edwards base administrator, co-operated with a will. He and his crew dismantled 5101, got her all ready and sent her out to Norton via Company truck.

Then the job—remodel the aircraft for display.

A flurry of activity began for

every man in the unit. The aircraft, with the exception of the cockpit, was gutted. A trailer was modified to meet the specifications of the T-38. The wings were taken off the bird and altered so they could be placed on the trailer in three different sections.

With the use of hydraulic jacks and winches and much ingenuity the aircraft could be loaded, trucked to a show, unloaded from the trailer and set up for display and still look exactly like an operational T-38.

After a paint job she looked like a new bird just off the assembly line ready to fly. The project took just a few short weeks.

Now the aircraft was ready but displaymen had to know the T-38 as well as any pilot.

Again Northrop was contacted. All available information on the T-38 was given to the unit's information and operations section. Major Harper was taken for a familiarization ride in the bird. From a mass of material a displayman's guide was developed with enough background information about the plane to do everything but fly the jet trainer.

The challenge was met and completely defeated. Only a public test remained.

On a recent Friday the test date arrived. The T-38 rolled out of Norton's main gate for its first public showing at Van Nuys.

A spectator's comment confirmed what displaymen already felt about their work when he wondered which of the display-

Tool Stores in the Modern Manner



GIVE US GOOD TOOLS—With pleasure, say Norair Tool Engineering folk, as they preview newest of the new in tool stores facilities. Recently installed on the T-38/F-5 twin assembly lines, modular system is open on all sides, light, airy, and utmost in efficiency. Here A. S. Turner, chief tool engineer, Tool Engineering; Stores Operator Pat Cleague; and John Musulin, supervisor, Tool Stores, check inventory of drills and other assembly aids.

CREDIT UNION DIVIDEND 5.5%

The Northrop Credit Union board of directors has declared a dividend of 5½% for the calendar year of 1962, it has been announced by Walter T. Gage, secretary-treasurer.

The dividend which will be entered in accounts during April will be taxable on the 1963 return.

It was also revealed that Credit Union clearings have now reached the astronomical figure of \$139.5 millions. This is total for the 16 years the organization has been in business.

men had flown the plane to Van Nuys.

In addition to 5101's adventures T-38 N-5102, left Norton AFB for Wright-Patterson Air Force Base on January 25 and will be converted in a similar manner, and made available to the remaining 39 states, through that office.

Airmen involved in T-38 modification at Norton AFB were M/Sgt. James R. Wallace, S/Sgt. Richard A. Lovett, T/Sgt. Edwin F. Miller, A1C John Redd, and A1C James Hendershott.

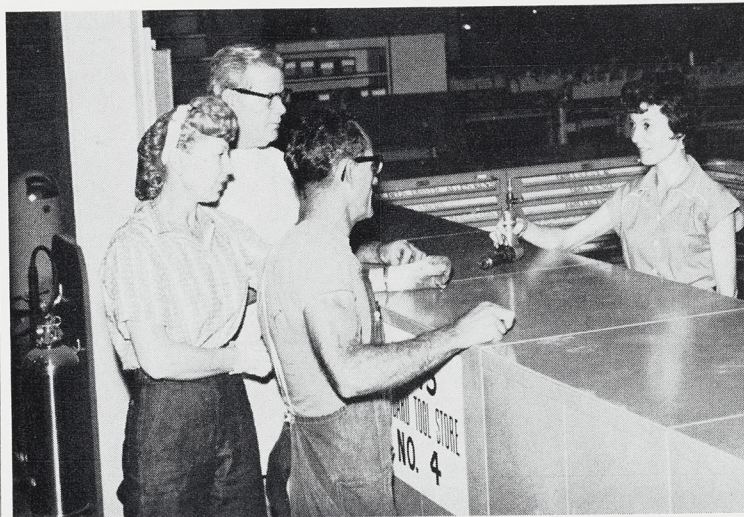
Also, late word is that 5101 might take time out from the western states for a trip to Europe.



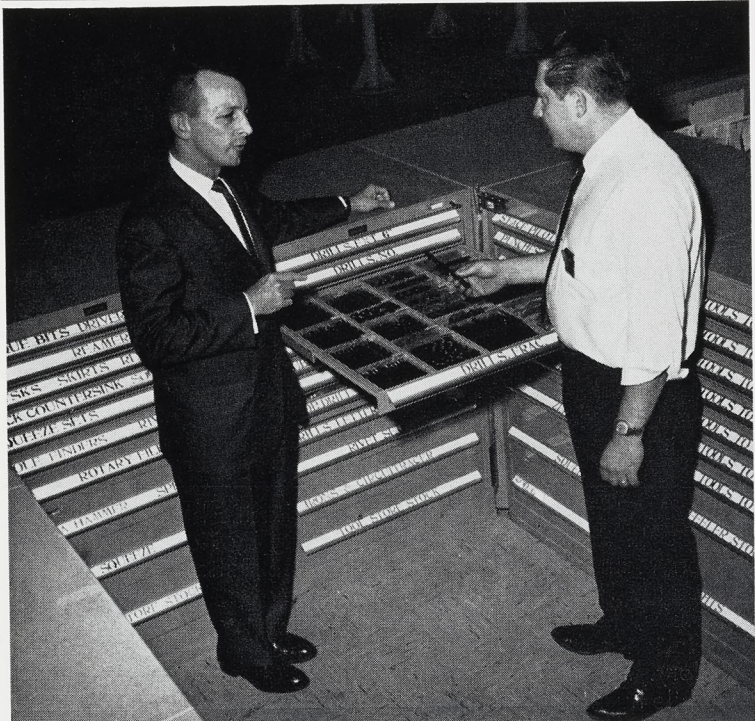
TEST HOP—A DT-38 (D for display) Talon jet trainer moves out on its maiden "flight" to Van Nuys. Norton Air Force Orientation Group experts added the T-38 to its display inventory after remodeling operation. Photo and story, first published in The Norton Newscome, Norton Air Force Base, were sent by Bob Kaminski, Norair Norton resident representative, Flight Safety Staff. When under way, wings and tail surfaces are removed and transported similar to Hawthorne Palmdale shipments.



SPACE SAVERS—New tool stores require only half as much space, will store 80 per cent more tools than the traditional walled-in, bolted-down, many-aisled, completely cloistered crib of the past. Photo shows Mr. Musulin and Sal Garguilo, supervisor, Standard Tooling, arranging "soft" supplies such as company-furnished goggles, gloves, cleansing compounds, aprons. Drawers roll on ball bearings and even when loaded with heaviest equipment, move in and out at finger touch.



"CUSTOMERS"—Here Miss Cleague illustrates optimum height of new tool stores "counter" as she issues rivet guns to from left, T-38/F-5 structural mechanics Esther Thorson and Ken Whited, and assemblyman Kurt Maggard. No more ringing for service for busy out-of-sight attendants. Cabinets, even if fully loaded, may be moved easily by forklift. Tile floor is sectioned and completely portable.

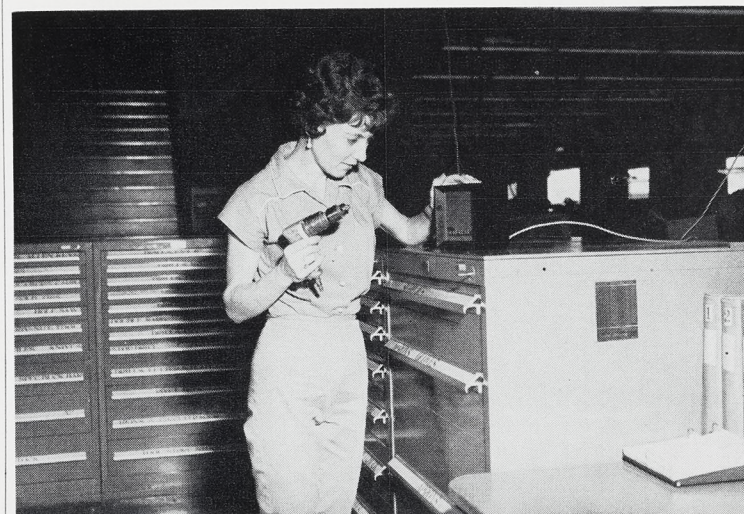


INVENTORY AT A GLANCE

—Mr. Turner and Mr. Musulin show neatly arranged contents of fractional drill drawer. Note drawer just above for numbered drills. At right are drawers especially designated for tools to be returned for sharpening and other maintenance. Note large stencils that tell contents.

TALK BOX—Miss Cleague demonstrates the Tool Stores' intercom which adds greatly to efficiency of operation. If needed tool is not in stock, it only takes

a moment to order it out from main supply. New tool stores system, Northrop specifications, was produced in a variety of configurations by Rack Engineering Co., Gardena.





RIDES WANTED

7 a.m. — 3:45 p.m.

SLAUSON & VAN NESS, Los Angeles. L. O. Quijano, ext. 2550, AX 4-2411. 2

ARTESIA & INDIANA, No. Long Beach. James F. McGrath, ext. 545. 2

200TH & ANZA, Torrance. Eveninas only. Connie Rivas, ext. 2170, OS 9-5652. 2

WARREN & BEACH, Huntington Beach. Adrian L. Nolder, ext. 2207, 4068, 847-6286. 2

7:30 a.m. — 4:15 p.m.

HAWTHORNE & LENNOX BLVD., Lennox. C. L. Taylor, ext. 2603, 2604, OR 2-1881. 3

SEPULVEDA & CULVER BLVD., Culver City. E. D. Peden, ext. 4284, EX 1-7014. 3

SPRING OR BALL RD. & LOS ALAMITOS BLVD., Cypress. Jeanette Nyland, ext. 1787. 3

8 a.m. — 4:45 p.m.

CENTURY & WESTERN, Los Angeles. Edna Ely, ext. 2151, PL 5-8369. 5

RIDES OFFERED

7 a.m. — 3:45 p.m.

WARREN & BEACH, Huntington Beach. Also ride to anyone in Westminster. Adrian L. Nolder, ext. 2207, 4068, 847-6286. 12

7:30 a.m. — 4:15 p.m.

CARSON ST. & PIONEER AVE., Artesia. Lyle H. Lawton, ext. 284. 13

SPRING OR BALL RD. & LOS ALAMITOS BLVD., Cypress. Jeanette Nyland, ext. 1787. 13

BBSF Classified Ads

BBSF classified ad service is provided free of charge to all Northrop Norair personnel.

Ads for agencies, commercial enterprises and private businesses are not accepted.

Deadline is noon Wednesday, one week before publication.

FOR SALE

TRAILER FRAME, welded steel, 4'x8', \$10. OS 5-0657. A

FORD, Tudor, 1955, 6-cyl., auto, trans., r/h, \$325. AX 4-8307. A

BANDSAW, 12", Craftsman, w/1/3-hp ball bearing motor & bench w/casters, 3 extra wood & metal cutting blades. \$60. FR 5-0915. A

WASHER-DRYER, RCA comb., \$175; bed-room set, maple, \$135; range, deluxe, \$35; refrigerator, 12 cu. ft. Servel, \$50; bandsaw, 3-wheel, \$12.50; table saw, 8", motor & stand, \$75; wheelbarrow, \$5; Big Boy bar-b-q on wheels, \$50; small garden tools, 25¢ & up. UN 3-9264. A

BABY CARRIAGE, collapsible, lifts out to make car bed, \$12 or 3 S&H Green Stamp books; dishwasher, GE, portable, \$55. FA 1-1655. A

FORD, Fairlane 500, 1957, 2-dr., h/top, V-8, auto, trans., \$495. EX 8-4007. A

JIGSAW, hvy-duty, on floor mount w/new motor, \$35; ping pong table, portable, \$10; wool rugs, 2, 9'x12', aqua, \$15 ea. 377-1274. A

PICKUP truck box & fenders, \$15. FR 4-2915. A

CORVETTE, 1960, 270, 3-spd. stick, low mileage, \$2500. AX 3-3926. A

CEDAR CHEST, \$25; antique tea cart, \$25; sewing machine, Singer treadle-type, \$22.50. PL 5-6301. A

CHEVROLET, 1953, 2-dr., 6-cyl., stick, o/hauled recently, good tires, good transportation, \$175. DA 9-2298. A

APT., unfurn., lae., modern, 1-bdrm., w/w carpet, drapes, stove, refrigerator, a/c, upstairs. \$95 mo. DA 9-0314. A

RUNABOUT, 16' Kelson Kraft, fiberglassed, 25 hp motor, trailer, accessories. \$300. GE 1-0843. A

PLYMOUTH, Plaza, 1958, 2-dr., r/h, stick shift. \$600. Box 501. A

RAPID READING KIT, w/phrase-o-scope, slides & book. \$10. 421-2935. A

BED FRAME, dble., box spring & inner-spring mattress. \$50. FR 5-6095. A

TYPEWRITER, Remington, office model, \$30. 372-4324. A

BABY FURNITURE, high chair, Babyline, convertible, \$7; stroller, \$9; car bed, \$4; Wonder Horse, small, \$5; jumpy chair, canvas, free w/complete purchase. OS 6-0749. A

GYM SET, for backyard, wooden, well built, \$25; bunk bed frames, maple, \$10; piano, training upright, \$125. OR 0-6896. A

FOR SALE

HOUSE, 3-bdrm., Compton & Crenshaw, birch kitchen, built-in stove & oven, garbage disposal, detached 2-car garage & building, carpet & drapes, slab patio & awning. \$21,500; camper, Suncruiser, 1962, sleeps 4, many extras, 2 jacks & platform dolly on rollers, \$800. DA 4-7959. A

MERCURY, 1956, convertible, new vinyl top, power steering. \$370. FR 4-8757. TV, 29". \$75. GR 7-4936. A

BUICK, Roadmaster, 1954, new transmission, r/h, w/w tires, \$150. OR 7-3809. A

MARINE DIESEL, Cummins, 4-cyl., 100 hp, 2-1 reduction, \$1750. OS 5-1842. A

CADILLAC, 1955, power, factory air cond. & new tires, \$695. OR 3-1539. A

BICYCLE, air's, 26", balloon tires, \$20. FR 8-4574. A

STOVE, Autotec, full size, about 1956, \$25. FR 7-4437. A

PICKUP TRUCK, KBI International, 1947, 1/2-ton equipped w/rack & cabinets for carrying construction materials, \$350. DA 3-4153. A

OLDSMOBILE, Dynamic 88, 1960, 4-dr., h/top, power steering & brakes, r/h, 1963 license. \$1750. EX 6-6823. A

MOVIE CAMERA, Keystone Bel Air K-41, magazine load, 8-mm, 4-spd., w/F-2.5 lens, telephoto lens, 1 1/2". F-3.5, \$25. DA 6-5935. A

COUCHES, 2 modern, soft brown kid, \$135 for both; end tables, 2, provincial, \$10 ea. PL 9-4920. A

IMPALA, 1958, 2-dr., h/top, 250 hp powerglide engine, r/h, approx. 36,000 miles. \$1100. 675-4752 after 4 p.m. A

STEEL GUITAR, Fender twin neck elec., w/case & stand, \$50. FR 7-7320. A

TRAILER, 16' Hummingbird, 7-yrs-old, sleeps 6, elec. brakes, fiberglass oven w/Robertshaw controls, butane & elec. lights, lots of storage space, \$650. EA 2-3319 eveninas. A

TRANSMITTER, Viking Valiant, 200 watts AM, 275 CW, VFO control on 160 to 10 meters. \$275. 755-6870 or PL 3-7302. A

HOUSE, R-4 lot, 2-bdrm., tile bath w/shower, Formica kitchen, garbage disposal, new auto, washer, 2-car garage, 6 mins. from Northrop, sell completely furn., \$15,950; drill press, Delta industrial model w/foot feed, \$125. PL 5-9481. A

CHEVROLET 6, 1955, 2-dr., auto, trans., 1-owner car, good transportation, \$300. PL 7-6973 after 5 p.m. or weekends. A

CHEVROLET, El Camino, 1959, 348 cu. in., 315 hp, tri. carb., stick shift, new rubber & paint. \$1675 or best offer. OS 9-6695. A

CADILLAC, Coupe De Ville, 1955, power brakes, windows, seats, \$50 above Blue Book. \$450. DA 4-7059. A

CROSLEY, station wagon, 1952, Austin Healey eng. & trans. w/extras parts, 4-spd., \$150; roll-a-way bed w/mattress, \$20; outboard motor, Elgin, 7 1/2 hp, \$45. OR 1-1660. A

VOLKSWAGEN, 1959, 31,000 miles, \$1100. FR 5-3945. A

VOLKSWAGEN, 1957, sedan, push button radio, white, \$885. AX 5-9997. A

TWIN BEDS, couch-style, w/innersprings, mattress, corner table, bolster pillows & spreads, \$60. OS 5-7938. A

WANTED TO BUY

SEWING MACHINE, portable, elec., straight stitch, Necchi, White, Singer, or Pfaff, reasonable price under \$75. 675-0876. B

VIBRA MASSAGE PAD, Niagara; lawn edger, reasonable. PL 4-1964. B

FOR TRADE

TYPEWRITER, Royal standard, late model, elite type, trade for Royal standard, late model, nica type. FR 5-7660. C

LABOR & parts to overhaul vacuum cleaner, trade for a beagle pup, female. FR 5-2920. C

RENTALS OFFERED

APT., 1-bdrm., triplex, near Northrop, large closets, disposal, garage, adults, no pets. \$90 mo. OS 6-5407. E

APTS., unfurn., private garage, redeco., disposal, encl. tub & pullman, tile kitchen, bath, adults & teenagers OK, water & trash paid, between 138th & 140th, 2 bdrm., \$95; 1 bdrm., \$75. OS 5-8335. E

HOUSE, 2-bdrm., gas range, furn., adults only, no pets, in Inglewood, \$115 mo. OR 7-2934. E

APT., 1-bdrm., stove, refrigerator, carport, near Northrop, shopping, drapes, lae, deluxe room, lots of closet space, \$85 mo. OS 5-9695. E

HOUSE, 2-bdrm., encl. porch, near Prairie Ave. & 133rd St., \$125 mo. FR 7-4926. E

HOUSE, 1-bdrm., unfurn., redecorated, in San Pedro area near Harbor Freeway & bus lines, children OK, for lease or \$75 mo. TE 1-1704. E

FOR SALE OR TRADE

FORD, station wagon, 1958, 4-dr., 6-cyl., r/h, stick shift, \$800 or trade for 1958-1959 Volvo or equivalent. 865-0508. M

DUPLEX, 6-yrs-old, 1 3-bdrm., 1 2-bdrm. unit, \$31,500 or trade. Take second mortgage. OR 4-8907. E



AND MORE TROPHIES—John Pawlicki, NRC Surf Fishing Club commissioner, standing left, himself a trophy winner, presents other Club members who caught glory as well as corbina last year. From left they are standing, Mr. Pawlicki, Joan Knotts, George Gale, A. H. Tacquard, Lionel Dube, Henry Legere, F. P. Schick. Seated from left, Wesley Blyleven, Ruth McCluskey, Mary Paddock, Winifred Tacquard, Clo Pawlicki, Sophia Scharff, Mickey Seigel, Mark Cardoza, and Brian Cote. Children in front are Jim Thompson, Debra Jane McCluskey, and Dennis Thompson. Photos were taken by Club member Dick Knotts.

Variety of Trips for NRC Packers

With the NRC Hikers and Packers Club successfully over the hill in their series of Sierra Club lectures and field trips, time has come to resume regular schedule.

Hikes already taken, as of last weekend, were in the Chantry Flats area.

Coming up and in the planning: April 20-21, Death Valley; April 27-28, Mt. San Geronio, of the skiing - Taylor Grazing area controversy; May 11-12, Mt. San Jacinto; May 30-June 2, medium altitude Sierra fishing trip. One day vacation will be required for this last.

For direct information, call Personnel Activities on station 2784.

NRC SKI CLUB PLANS TRIP TO MAMMOTH

Mother nature has smiled on the NRC Ski Club. There is plenty (at presstime, at least) of snow at Mammoth Mountain. Consequently April 5 weekend is the time of the next trip.

Members will stay at Berners Lodge, fee being \$3 a night for each person.

A meeting will be held tonight, March 27, at the Clubhouse, 7:30 p.m., to coordinate transportation and other outing details.

LOST

TIE PIN, small square gold, lost in Engineering Center. OR 1-6692. J

PERSONALS

SINCERE APPRECIATION for the expressions of sympathy and kindness during the loss of our beloved husband, father & son, JUNE, PAMELA & LILLIAN BOYLE.

OPENINGS in A & E Flying Club, \$200 initiation fee, Cessna 140, \$4/hr.; 170, \$6/hr.; 172, \$6.50/hr.; Bonanza, \$10/hr.; Meyers 200A, \$12.50/hr.; prospective applicants invited to regular meeting at Product Display Bldg., Weds., March 27, 7:30 p.m. DA 4-2992 after 5:30 p.m. L



SURF KNOW-HOW—Payoff for surf savvy comes to quintette of NRC folk as aggregate weight trophies for 1962 are presented. From left are Mary Paddock, Winifred Tacquard, C. L. Brush, Ida and Lionel Dube. In addition to handsome mantelpiece numbers, these fishermen (and women) filled the icebox too. Surf Fishing Club meets first Tuesday of each month.

Island Fishermen



FROM HAWAII—Big, 284 pounds, Pacific blue marlin is brought to the Kona, Hawaii landing by Northrop vacation team and friends from left, Leo Satterlee, Howard Young, Harold Barbey, Bob Becker, and the brothers Cribbs, Louis and Joe. Charter boat used the two-rod rotation system, each man sharing in the fish and in the glory. Mr. Marlin fought for 30 minutes. On this day while husbands fished, wives went on Kona tour.

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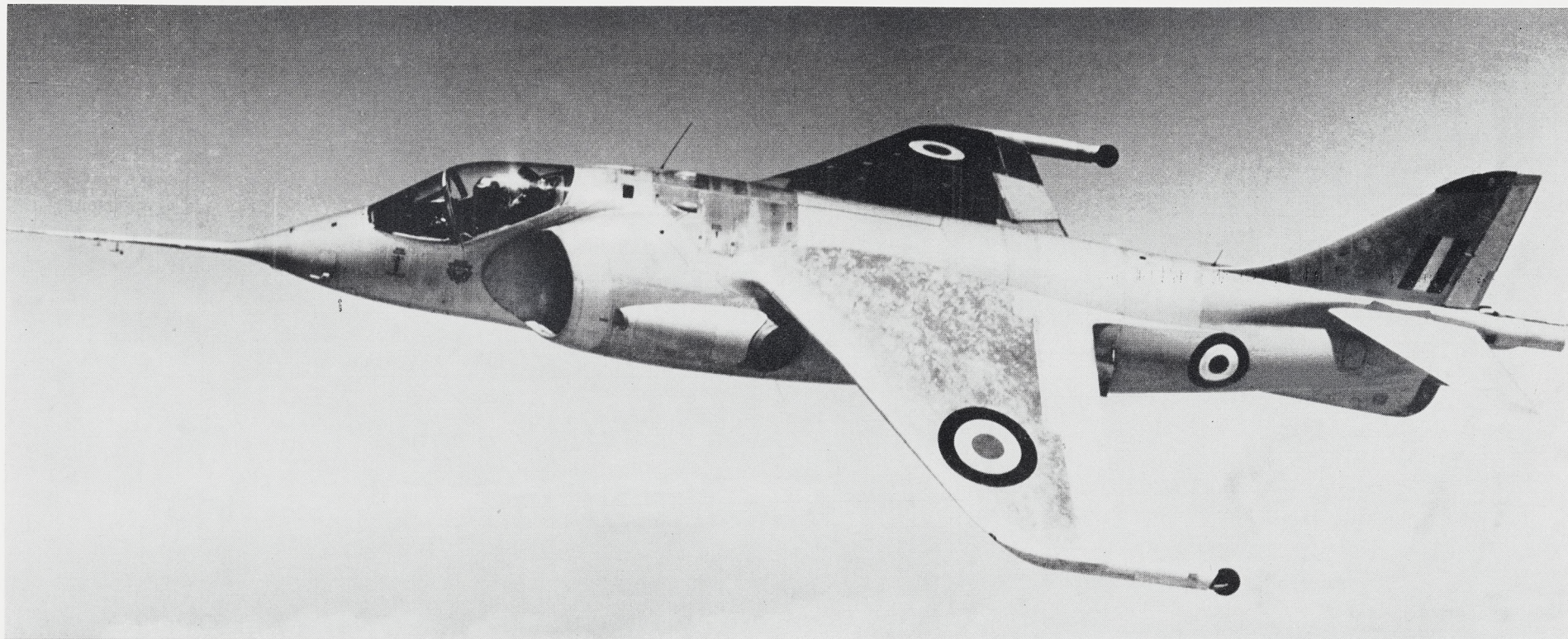
Northrop Norair News

Issued biweekly by Norair Division of Northrop Corporation • Wednesday, April 10, 1963

HAWTHORNE, EDWARDS AFB, PALMDALE

SAN ANTONIO, EL PASO

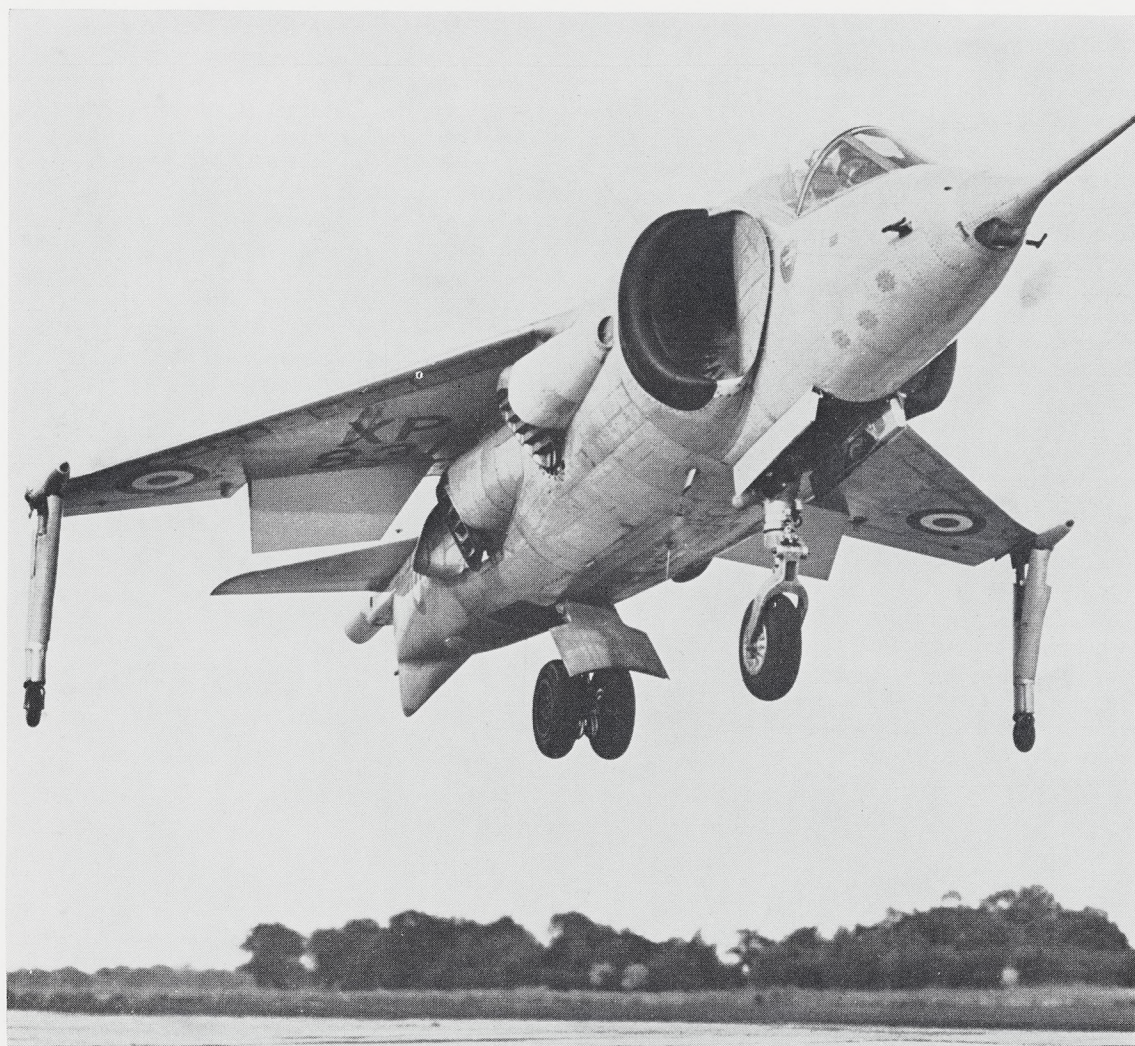
P.1127 PHOTOS FROM ENGLAND



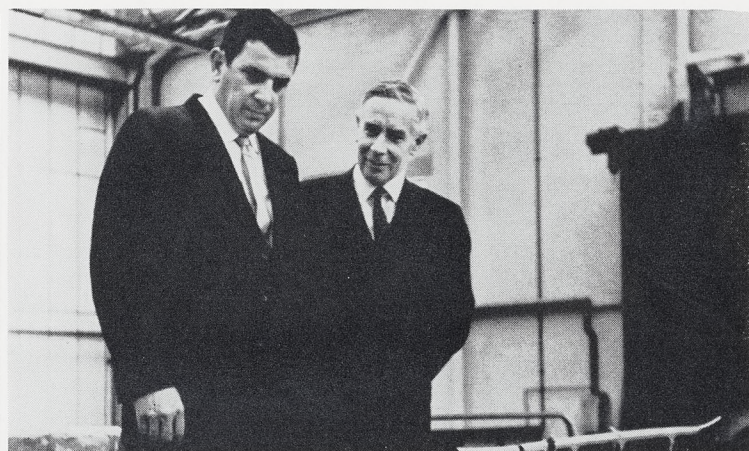
IN FLIGHT OVER ENGLAND—Photo of third P.1127 prototype in flight, brought back from Hawker Aviation Limited by George Grogan, Norair project director, shows significant configuration points. Outrigger gear is retracted aft. The four jet directional nozzles are synchronized. Front nozzle on this side of airplane is seen just below wing root leading edge fairing. Pilot controls direction of thrust with a single lever control. For vertical takeoff, brakes are set and remain set, nozzles are pointed aft,

engine is started and run up, nozzles are then quickly rotated 90 degrees for downward thrust. Airplane lifts. When sufficient height is reached, nozzles are gradually rotated aft. Airplane maintains level attitude, continues to lift and at the same time begins forward motion. When flying speed is reached nozzle thrust is all aft in conventional manner. Landing is accomplished with procedures essentially reversed. Nozzles are used for braking in flight when airplane prepares to set down.

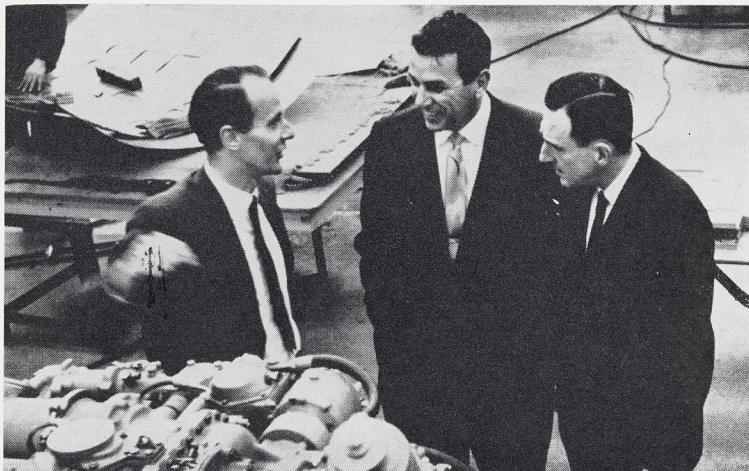
SEE P.1127 STORY, PAGE 2



HOVERING—Hawker Aviation's P.1127 is shown here hovering at 6 feet. Location is the Hawker Flight Test facility at Dunsfold. Note that inflatable inlet lip is here inflated to improve air intake efficiency while the airplane is aloft and stationary. The enlarged lip radius eliminates separated flow in the inlet. In normal flight, with air ramming in from straight ahead, lip is deflated. Here thrust nozzles, positioned for vertical lift, are plainly seen. Front nozzles are for cool fan air, while rear nozzles exhaust the hot engine gases. Outrigger gear is in landing position. P.1127 is close to the T-38 and F-5 in size. Wings have the same sweep.



DISCUSSION—Welko Gasich, Norair vice-president and assistant general manager, Technical, discusses features of the P.1127 V/STOL airplane with Robert L. Lickley, deputy managing director, Hawker Aviation Limited and managing director, Folland Aircraft Limited. Mr. Gasich spent two days in Britain studying P.1127 development and relating Norair technical capability to the project.



PEGASUS ENGINE — Ralph Hooper, Hawker Aviation's P.1127 project engineer, explains to Mr. Gasich and Mr. Grogan features of the Pegasus engine which powers the airplane. Photo was taken in Hawker's development shop at Kingston upon Thames. Engine shown is a mockup. Mr. Grogan stayed 10 days in England. He and Mr. Gasich also visited Bristol Siddeley Engine Limited, manufacturers of the Pegasus.

Technical Interchange On P.1127 Underway

NOLAN TELLS IMPORTANCE TO NORAIR

Welko Gasich, Northrop Norair vice-president and assistant general manager, Technical and George Grogan, director, P.1127 project have returned from England where they visited Hawker Aviation Ltd. and Bristol Siddeley Engine Ltd., to discuss the joint effort undertaking on the V/STOL (Vertical and Short Takeoff and Landing) aircraft.

The P.1127 is the world's first military V/STOL aircraft. The aircraft is able to fly forward or backward in level flight and up and down vertically. This revolutionary capability for vertical flight enables it to operate without runways. It also hovers in fixed position like a helicopter.

In commenting on status of the P.1127 program and V/STOL significance to Norair, Corporate Vice-president and Division General Manager Dick Nolan said that an extensive program of technical interchange between Hawker Aviation and Northrop is under way.

"Norair Division," he stated, "is also conducting a detailed review of sales potential, marketing methods, customer uses, and service and logistics factors required for an airplane of this type."

"Collaboration with Hawker on the P.1127 presents Norair with a splendid opportunity. V/STOL airplanes are destined to become a big product factor in the aerospace industry. The P.1127—with prototypes already capable of vertical lift and descent, forward transonic flight, rearward flight to as high as 15 knots—opens the door for Nor-

air to a very attractive long range activity."

The News was advised by Mr. Grogan that P.1127 test pilot Hugh Merewether, a pioneer in the V/STOL field, is now visiting the plant. He is being given briefings and a firsthand look at Norair capability and is to take an orientation ride in the T-38. Mr. Merewether addressed a group composed of Company management, engineers and test pilots on P.1127 flight techniques yesterday morning in the Science Center auditorium.

Mr. Merewether was in Washington last week where he delivered a scientific paper before the Society of Automotive Engineers—American Society of Naval Engineers' national meeting.

Current P.1127 production aircraft now being built at Hawker Aviation are scheduled to be used by a tripartite squadron composed of United States, the United Kingdom, and West Germany. Flight operations will be conducted in England to explore the operational feasibility of the P.1127.

Construction of the P.1127 began as a private venture by Hawker in May 1959.

**Buy
Savings
Bonds**

Air Force T-38 Flights Illustrate Airspace Use

Key management personnel from civilian airlines, the Federal Aviation Agency, and other agencies were taken for demonstration rides in the T-38 at Williams Air Force Base, Mesa, Arizona, as piece de resistance of a meeting to develop personal relations between joint users of airspace in Arizona.

Due to the large number of civilian and military aircraft using airspace over Arizona a continuous exchange of viewpoints to effectively promote safety is necessary.

Northrop representative at the meeting was Hank Chouteau, F-5A project test pilot.

The civilian visitors were given briefings to thoroughly acquaint them with Willie local flying area and associated air traffic.

The briefing included graphic presentations of traffic patterns and letdown areas at Goodyear auxiliary field and Williams AFB; instrument training pro-

cedures in use at Davis-Monthan and Williams; and IFR (Instrument Flight Rules) and VFR (Visual Flight Rules) landing and takeoff procedures and routes.

Bill Decker, Air Route Traffic Control Center, Phoenix, discussed proposed change in Williams AFB flying areas that would give the base more space while clearing important civilian air routes of military training aircraft, thereby increasing flying safety in this area.

In the afternoon, civilian officials were given T-38 orientation rides to demonstrate, in the most direct manner, the special problems that military pilots have to cope with while flying in excess of the speed of sound.

Colonel Michael C. McCarthy, commander, 3525th Pilot Training Group, gave a summary of the 54-week training program student pilots undergo in the Undergraduate Pilot Training Program to make them professionals in their chosen field.

Bob Manning, chief pilot, Bonanza Airlines, compared the present training requirements of the military pilot with the "old days" when he and several of the other visitors went through the Army Air Corps cadet training program. He praised the modern pilot training program and said that today's graduates of military schools are professionals.



MILESTONE—The Boeing Company subcontract has reached a milestone—the 1000th jet transport wing completed and shipped. In recognition Norair, Boeing, and Air Force officials, and Bill Minner, Manufacturing superintendent and his crews took time out for Norair News pictorial. Key men on the contract from left are Harvey Cook, project engineer, Special Projects Control; Art Webb, supervisor and Virgil Grubbs, senior engineer, Liaison Engineering; Elmer Bailey, USAF supervisor, Materiel Quality branch; Mr. Kirby; George Swanner and John Holman, general foremen; George Savidan, Program Planning coordinator; Wendell Howard, contract administrator, Contract Administration; Don McCown, supervisor, Manufacturing Control.

Computer Errors Fade as Tape Verifier Invention Takes Over

How accurate do you think you are? Could you copy on a typewriter 18,000 letters or numbers an hour with an error rate of only one wrong character out of 65? (That's about 280 errors an hour.) This is the minimum required for secretarial rating.

Do you think you could slow down to 12,000 characters an hour and reduce your error rate to one wrong character out of 200? (That's only 60 errors an hour.) This is what a good keypunch operator can achieve.

If you were allowed to slow down even more, could you improve error rate to the point at which you could copy letters and numbers on a typewriter with an accuracy of only one mistake out of a million characters? If so, you are still not helping the IBM 7090 electronic data processor to do a good job because even that error rate would mean the computer is handling wrong information at the rate of better than one wrong character every second, or 3600 mistakes an hour. Add to this the fact that the wrong information generates new wrong information in the processing, and the compounding of the error staggers the imagination and costs Northrop a lot of time and money.

This is why everything that is keypunched from original source documents in the Information Processing Center (IPC) must be verified by a different operator before ever being presented to a computer.

The new Automated Master Parts Listing Subsystem (AMPLS) provides its listing of information on thousands of parts that it must handle in the form of punched paper tape for which there has been no commercial verifier available. Because of the significance of handling unverified information, the girls who prepare the punched paper tapes exercised more caution in their keypunching than is done in ordinary keypunching and the error rate ran from 1 in 1000 for a 30-day trainee to 1 in 5000 to 10,000 for experienced operators.

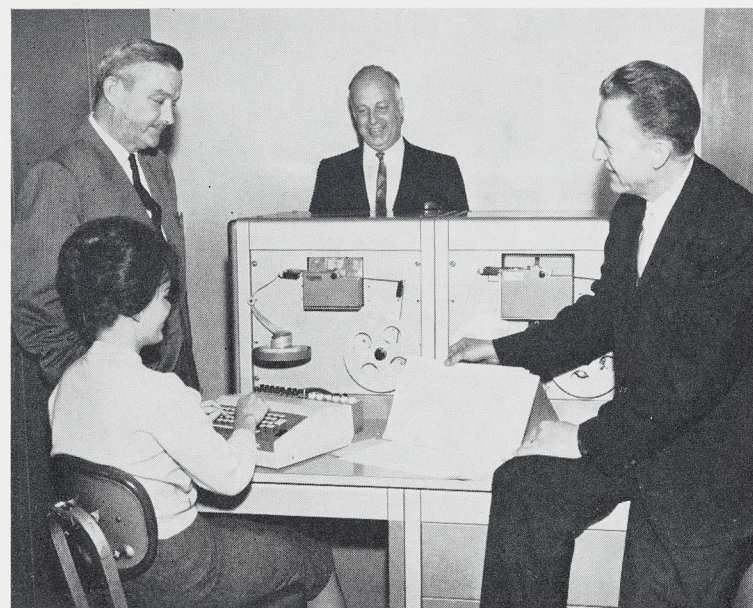
To allay this "built-in" condition of error expectancy, the Information Processing Center developed a new punched paper tape verifier that will increase the accuracy by a factor of as much as 100,000 times with a sacrifice in speed of only one-half. The new machine was invented jointly by Lee Ohlinger, director of IPC, and Don Hannum, his technical staff assistant who has many new developments to his credit. It was built by the Development and Maintenance group in the IPC under the leadership of "Red" Burdette, and the first machine is now being used regularly to verify the AMPLS tapes.

Grant Macdonnell, Norair treasurer, was keenly interested in this new machine because it involves not only a reduction in operating costs through the production of more accurate information but also has commercial possibilities and can be licensed for production by one of the current equipment manufacturers.

T. L. McCarthy, manager, Administration, to whom the IPC reports, feels that this development is just one more indication of the creative versatility and flexibility of Norair's Information Processing Center which has been so helpful in the Division's cost improvement effort.

This verifier, which is the first of three to be built by IPC personnel for use at Norair, is doubly protected because it verifies not only the punching performed by the first operator but also checks itself against introducing errors as a result of mechanical failure of its own internal mechanism.

George Pond, supervisor for Master Parts Listing branch in Engineering, feels that this machine has significant intangible but potential value because errors introduced into the initial Master Parts List find their way into many different departments in the Division and require a disproportionate amount of work to follow up and weed out.



TAPE VERIFIER INVENTION—A distinct contribution to the computer art has been achieved at Norair by development of punched paper tape verifier. From left, Division Treasurer Grant Macdonnell and co-inventors Don Hannum, technical staff assistant and Lee Ohlinger, director, Information Processing Center watch as Programmatic Typist Linda Massey puts machine through typical run. New development increases accuracy by factor of as much as 100,000 times.

Northrop Norair News

VOL. 21 NO. 6

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PUBLICATION

NORAIR DIVISION
Published every other Wednesday

CHARLES BRADFORD, Editor

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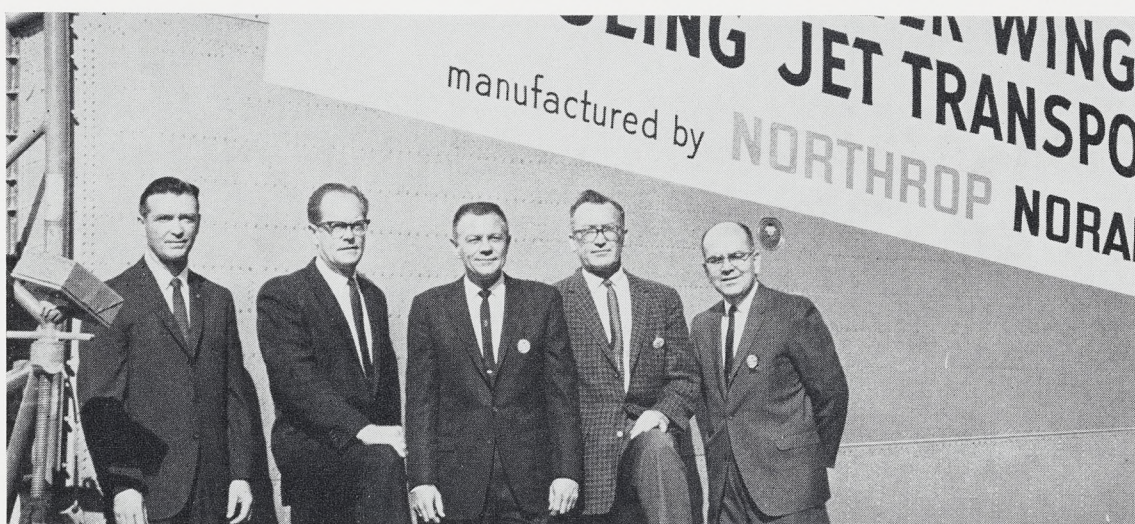


KOREN'S CRUSADERS—Andy Koren's fine group from Wing Structure and Sub, from left, Howard Sellers, inspector; Floyd Cameron, mechanic; Harold Hulen, assembler; Alfred Grove and Opal Briggs, mechanics; Mr. Koren, foreman; Victor Heiner and Carl Angeloty, mechanics; George Elicker, electrician; Morris Holstine, mechanic; Robert Barcelo, drivmatic operator; Ivan Milburn, assembler; and Clyde Stevens, mechanic.

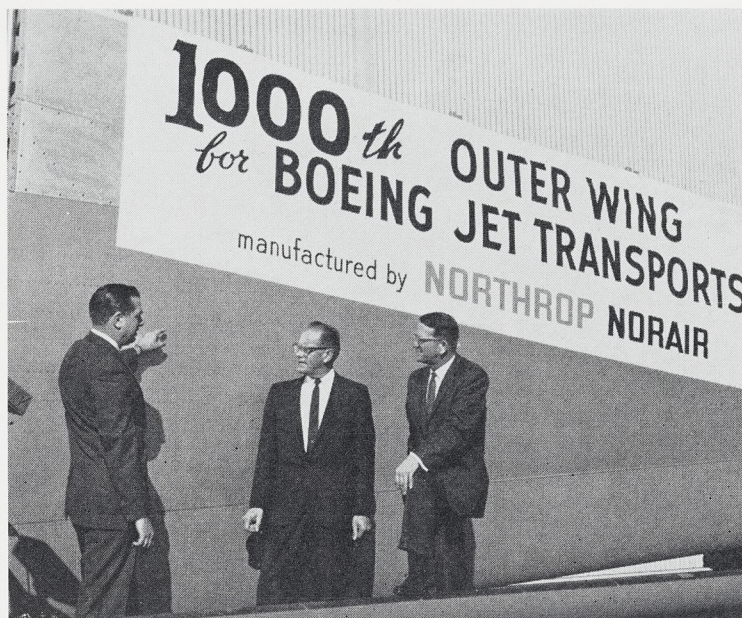


WARNER'S WING BUILDERS—From Ailerons, Tips, and Wing Final, left to right, Archie Kneff and M. P. Perry, engineers; Edward Ferguson, painter; Larry Slininger and Jody Pierce, mechanics; Mel Wilkinson, inspector; Floyd Dean, mechanic; John Warner, foreman; Turk Hassan, inspector; James Black, jr., mechanic; Jimmie Smith, assembler; Ralph Gonzales, Chester Gowin, mechanics; Lawrence Hendershott, assembler.

ONE GRAND



BOEING REPRESENTATIVE TEAM—Men who guide progress of 707/KC-135 subcontract work are from left Fred Walker, Boeing Quality Control representative, Lou Gilster, assistant superintendent, outside Quality Control, and fourth left, Bruce Frost, senior supervisor, outside Quality Control. They are photoed with Norair's Guy Kirby, center, general supervisor, Subcontracts Assembly Inspection and Dan O'Halloran, chief, Quality Control, right.



PLEASED CUSTOMER—Mr. Minner, Boeing's Mr. Gilster, and Dick Nolan, Corporate vice-president and Norair general manager review 1000th unit. Contract, which started in April 1955, has been repeatedly renewed as demand for the 707 and the KC-135 continues undiminished. Work currently extends to early 1965. Northrop also manufactures aft fuselages for the big jet. Final assembly of the Boeing transports, both military and commercial takes place in Renton, Washington.



BOKMA'S GOOD TEAM—More men and women of Wing Structure and Sub, from left, Alice Miles and Marie Wilson, assemblers; Alice Callahan, mechanic; Etta Goesser, hot dimple operator; Seleatha Hicks and Gertrude Lehman, assemblers; Thelma Rumbo, Freda Byfield, Ruth Williams, and Ruth Miller, mechanics; Harold Bokma, foreman; Bonnie Henderson, mechanic; Zina Morris, inspector; Slim Langland and Tony Bradasich, mechanics; Carl Brandon, assembler; Carlton Fielder, mechanic; Jose Ortiz, assembler; and Francis Williams, hot dimple operator.



SHUTTS' STALWARTS—Lewis Shutts' group from Ailerons, Tips and Wing Final, from left, Ray Barak and Lenny Sandhoefner, inspectors; Alfonso Barbero and Eddie Linton, assemblers; Warren Parkhurst, Boeing representative; Virginia Harbold and Marjorie Tobiason, mechanics; Viola Robinson, assembler; Bessie McClure, mechanic; Therman Washington and Louis Harter, assemblers; Tony Lobise, Orrie Ahmann, Frank Johnson, Leo Weidenkopf, Ralph Herrera and Mary Hinze, mechanics; Julio Yniguez, inspector; and Mr. Shutts, foreman.



D'ANGELO'S ANGELS—Wing and Structure Sub's good crew and smiling from left, Michael Markert, Matthew Rebmann, Paul Reeves, Lionel Dube, Louis Gonzales, Glenn Rollins, mechanics; Sam D'Angelo, foreman; Arthur Tacquard and George Roth, mechanics; Oral Smith, assembler; Clifford Fiers, Thomas Reagan, and Joe Salazar, mechanics.



TORBETTE'S TERRIERS—Another team from Wing Structure and Sub, from left, Bill Zimmerlin, inspector; Holland Heard, drivmatic operator; William Watson, mechanic; Raymond Heck, assembler; H. T. Torbette, foreman; Tony Queiros, assembler; Charles Stackhouse, mechanic; Manuel Duran, assembler; Joe Harris, Griffie Barnes, mechanics.



RIDES WANTED

7 a.m. — 3:45 p.m.

CRENSHAW & 190TH ST., Torrance. N. W. Miller, ext. 4063, DA 9-5696. 2

ALONDRA & LONG BEACH BLVD., Compton. Richard F. Espinoza, ext. 2681. 2

7:30 a.m. — 4:15 p.m.

HAWTHORNE BLVD. & 104TH ST., Inglewood. Irene E. McCarthy, ext. 1501. 1502. 1503 672-7506. 3

RIDES OFFERED

7 a.m. — 3:45 p.m.

ALONDRA & LONG BEACH BLVD., Compton. Richard F. Espinoza, ext. 2681. 12

BBSF Classified Ads

BBSF classified ad service is provided free of charge to all Northrop Norair personnel.

FOR SALE

BOAT, 15'. Sport-Fisherman cabin, Johnson 30 hp motor, portable bait tank, \$500. 371-9730. A

METRO, 1960, h/top, \$770; service porch sink, \$10; oxy. & acet. equip., burn & weld, \$87.50; deep well pump, 1 hp & 50' plastic pipe, \$87.50. VE 7-4237.

EXPLORER SCOUT UNIFORM, complete, size 16, \$7.50; bicycle, boy's, 24", \$10; hydroplane, 8', 12 hp outboard motor, fully equipped & controls, \$150. FR 5-0061.

CAMERA, AGFA AMBI Sillette, 50-mm. 1.2 lens, detachable, BEWI lightmeter, case, AGFA flash attachment, cost \$75, \$45. DA 9-3979 after 6 p.m. A

TRANSCIEVER, citizen's band, executive 100, w/ microphone, crystals, 110 V-12 V conversion plugs, mobile antenna & key, locking bracket, \$175. DA 6-1572. A

RANCHERO, 1959, r/h, new paint, \$1150; surfboard, Bina. \$85; cabin cruiser, Fine Craft, 16.9', 2 30-hp motors, w/trailer, extras. \$750. DA 4-6203. A

APARTMENT BLDG. 4-unit, 1 3-bdrm., studio-type, 1 1/2 baths, fireplace, 1600 sq. ft., 3 2-bdrm. units, 900 sq. ft. each rented, patios, built-ins, disposals, carpets & drapes, carport, laundry room 6 blocks to Northrop, \$58,750. 772-1992. A

VOLKSWAGEN, 1957, deluxe, w/radio, \$725. CR 6-3534. A

POOL, rigid wall plastic, 10' dia. x 2' deep. \$15. 675-7061. A

REFRIGERATOR, GE, 7 1/2 cu. ft., white, 6-yrs-old, \$60. 477-6804. A

CHEVROLET, 1953, 2-dr., w/new Corvete 6 engine, floor shift, \$450 or best offer. FR 7-5075 after 5 p.m. A

COMBINATION WASHER, gas dryer, Bendix, \$125; TV, Sears, 24", \$75. FR 8-3990. A

BOAT, 16', Burchcraft, deep fisherman's, glassed bottom, framed mahogany windshield, bait tank w/pump, 30 hp Mercury eng. w/elec. starter, battery, running lights, life jackets, rope & anchor, trailer, \$800. Box 601.

FORD, 1959, black, 2-dr., h/top, power steering, r/h, 29,000 miles, needs tune up. \$850. 679-4889 after 4:30 p.m. A

PUPS, 8-wks.-old, poodles, AKC registered, male & female, silver miniatures, \$150 value, \$65 ea. FA 1-4026 between 9 a.m. & 4 p.m. A

AUSTIN HEALEY SPRITE, 1959, \$950. 329-3949 evenings. A

CHEVROLET, Bel Air, 1958, 411 cu. in. 1959 Pontiac engine, C & O. hydro., r/h. chrome rims \$1100. DA 9-7649. A

SKI PANTS, women's, black, size 11, pr., cost \$40, \$15; after ski boots, women's, black suede, size 8-8 1/2, \$8. CR 3-2194. A

REFRIGERATOR, 12 cu. ft., gas, Servel, 40-lb. cap. freezer, \$55. FR 4-8036. A

STOVE, Frigidaire, dble. oven, elec., w/deep well. \$50. FR 8-8925. A

AUTOLOADER, Rem. 3006, model 742, \$140 value. \$45 675-7465. A

SURFBOARDS, David Sweet, 8' 11", Greg Noll, 8' 4" \$60; Ev'nudes, 25 hp, pr. elec. starting: propellers, Michigan brass, 2 spare props, if sold as pair will include 6-mo-old marine battery \$300 for both or \$150 ea. PL 5-2784

SWIMMING POOL, Doughboy, 23' dia. x 4' deep w/filter, skimmer, vacuum, etc., \$200; boat, 1962 Volvo, alum., 15 1/2', 40 hp Johnson elec. skis, ladder, ropes, etc., \$1095. PL 6-8095 A

GOLF CLUBS, woods & irons w/case, \$25; roller shoe skates, air's, size 5 1/2 white, boy's, size 7, black, w/cases, \$7 nr. DA 4-5774 evenings & weekends. A

VALIANT, V-200, 1960 4-dr. sedan, r/h, \$1250. OS 5-8335 A

FORD, Fairlane Victoria, 1956 2-dr. h/top, r/h, \$275 or best offer. FA 0-2273.

FOR SALE

LINCOLN, Continental convert., 1959, Mark IV, full power, \$2095. AX 3-2646 after 6 p.m. A

WINCH., 12 aa., dbl. w/30" barrel, \$75; pump, 12 aa., J. C. Higgins w/compensators, w/ammo & cartridge belt, \$40. 633-5898. A

CORVAIR, Monza coupe, 1962, 4-spd. stick, r/h \$1950, \$200 & take o/payments of \$81.11 mo. OR 2-5306. A

HOUSE TRAILER, 16', many extras, elec. butane & battery lighting system, sleeps 4. \$850. CL 6-5861. A

HOUSEHOLD GOODS, storage trunk, \$3; table w/shelves & castors, \$3; patio chair, 2-seat, \$20; misc. garden tools & plants, 25¢ to \$2; motors, small elec. 50¢ to \$2; metal cabinet, lae., sliding doors & shelf, \$5. PL 7-6973. A

DEEP FREEZE, Philco, upright, \$68 327-7287. A

FORD, 1955 Ranch Wagon, r/h, o/drive \$300. FR 7-1732. A

HOUSE, 3-bdrm., 1 1/2 baths, kitchen built-ins, 2-car garage, carport, \$26,750; range, gas, 40" Tappan, \$38; TV, 21" RCA, \$40. TE 3-3036. A

VAUXHALL, 1958 station wagon, \$425. WA 3-1425. A

TYPEWRITER, Remington portable, \$25. AX 2-4958. A

TWIN BEDS, maple, foam rubber mattresses, \$60. PL 5-8369. A

MOTORCYCLE, Puch, 250 cc., \$440. OR 7-5617. A

PUPS, toy poodle, silver, AKC reg., \$250. Box 602. A

PLYMOUTH, 1957, r/h, rebuilt eng., \$625. DA 9-2181. A

CORVAIR, 1960, 2-dr., 3-spd. stick, \$995. DA 6-2695. A

CAMPER, \$225; boat, 18' Burchcraft, 50 hp Mercury, large-wheel trailer, \$1150. DA 7-0304. A

REFRIGERATOR, Hot Point, 9 cu. ft., \$80. FR 7-3487. A

DINING SET, Duncan Phyfe, 6 chairs, table pad, buffet, \$135. OS 6-5288. A

CHINA CLOSET & dining table, maple, \$60 or sell separately; occasional chairs 2, blonde, \$5 ea.; sprinkler hose, 50' \$1. OS 6-4388. A

BACKPACK, metal frame & bag, \$5; car radio, Motorola, 6-volt, \$5; fluorescent desk light, \$2; ice cream freezer, 6-at. \$3. GE 1-4233. A

ORGANO attachment for piano, \$75; evaporative cooler, portable, \$10; alad-iron, Thor, \$15. OS 5-1818. A

ONE ACRE, Deschutes River in Oregon, 258' river frontage, private lake for land owners, \$5990 value, \$980 equity, \$4010 balance. OS 6-3501 after 5:30 p.m. A

RUG, imported, 10'x14' w/rubber pad, \$50; saxophone, Conn B-flat, \$195; windows, 2 regular, 3'x4 1/2', \$5 ea.; 2 1/2'x3' \$3. OS 6-5634. A

FORD, 1951, 4-dr., 6-cyl., stick, radio, \$125. TE 3-7377. A

PUPS, \$2 ea. DA 3-8685. A

CAMERA, Petri 2.8 lens, aux. wide-angle & telephoto lenses, lightmeter, \$50. OR 7-1129. A

DOORS w/glass, 36"x84", \$10; 2, 42"x 94", \$10; 36"x79", \$5; picture windows, 5'x5', \$5; 48"x54" \$5. OS 6-5634. A

FOR TRADE

FORD, Tudor, 1951, r/h, auto, trans., trade for 1949 or 1950 Ford convertible DA 4-8663. C

FREE (to be given away)

DOG, male collie, 5-yr-old, sable, has license, DA 6-4204. D

RENTALS OFFERED

HOUSE, 2-bdrm., 2 children OK, no pets, \$85. 371-6775. A

APT., 1-bdrm., unfurn., near Northrop, \$65. OR 1-5267. E

APT., 1-bdrm., unfurn., 2 miles from Norair, adults, \$80 mo. OR 4-0755. E

APT., 2-bdrm., unfurn., 1 child OK, \$120 mo. OS 5-5898. E

APT., 1-bdrm., newly decorated, \$89. OS 6-3489. E

HOME, 3-bdrm., unfurn., utilities paid, \$165 mo. DA 5-2077 after 4 p.m. E

APT., 1-bdrm., near Northrop, furn. or unfurn., \$80-\$95. OS 5-9695. E

HOUSE, 1-bdrm., unfurn., redecorated, children OK, for lease or \$60 mo. TE 1-1704. E

LOST

GLASSES, prescription, avy frames, brown case, Plant 3 area. Ext. 2141. J

PERSONALS

MOST SINCERE thanks & appreciation to all my good friends who so kindly remembered me with a gift & cards during my illness. FRED FUNDER. L

FOR SALE OR TRADE

CHEVROLET, pickup, 1952, 3/4-ton w/4-spd. trans., lae. bed, \$425 or trade for Ford or Chevrolet pass. car of equal val. FR 4-5728 after 5 p.m. or weekends. M

FORD, 1953, V-8, 4-dr., \$250 or trade for equity in 1957 station wagon. Box 603. M

Painting Is for Everybody



ART CLUB ACTION—John Kayser, Norair NRC Art Club commissioner explains oil painting techniques to assembled art class during a regular Thursday night meeting. From left seated are Bill Lawenda, Stelita Graveline, Tom Kulp. Standing, Jo Ann Prien (in corner), Arnie Simoli, Bob Laina, Ronald Schaffer, and George Neeland. Art classes, held at Joe Kalina's studio, 3234 West 157 Street, Gardena, are free. Models are furnished by the NRC. Anyone can join. Just call Personnel Activities.

Play Ball! Softball Season Here

The first NRC softball leagues of the season have made timely appearances. A slo pitch for Tuesday evenings and a regulation pitch for Wednesdays are both set to start the third week in May.

To limber up the old muscles, practice rounds will begin on April 23, says Fred Armstrong, NRC president. For practice locations call Personnel Activities on 2784.

To enroll, prepare team roster and player applications. Deadline is April 17. All forms are available at Personnel Activities.

SUMMER BOWLING LEAGUES START, TEAMS FORMING

NRC day shift summer bowling leagues are now being formed and Norair people who wish to participate are advised that entry forms are available at Personnel Activities.

Commissioners Bill Myerson and Corinne Davis have published list of leagues, locations and types of play.

Thursdays, 6:15 p.m., Missile, mixed 4 handicap, 630 maximum, 10 teams. Starts April 25.

Thursdays, 6:25 p.m., Gardena, mix trio, approximate 500 scratch, 10 teams. Starts April 25.

Wednesdays, 6:25 p.m., Del Mar, men's scratch trio, 510-520, 8 teams. Starts April 24.

Wednesdays, 6:15 p.m., Missile, mixed 4 handicap, 640 maximum, 12 teams. Starts April 24.

Tuesdays, 6:25 p.m., Del Mar, mixed 4 scratch, 570-585, 8 teams. Starts April 30.

Mondays, 6:25 p.m., Tropicana, mixed 4 handicap, 10 teams. Starts May 6.

Norair man Stu Oliver has turned the magic trick in bowling. He rolled a 300 which when put together with his other scores made a 706 game. It happened at Morningside Recreation on March 20. It was not in NRC league, but NRC trophies are in the works.

NRC Art Club Welcomes All Who Like to Draw

Each Thursday evening the NRC Art Club gathers in a comfortable studio where members take pencil or brush in hand to capture the face and figure of registered professional models. All at no cost to the artist except for materials as noted below. Basic expenses are sponsored by the NRC.

John Kayser, Norair Art Club commissioner acts as co-host with Joe Kalina, Nortronics commissioner, at the latter's studio behind his home in Gardena.

Members furnish their own art supplies. New members who have just joined and are not yet sure what medium they wish to work with can share supplies with experienced members until they make a choice of oils, charcoal, pastels, tempera or other more exotic materials.

John and Joe and some of the older members always offer instruction to any new members who wish a helping hand or any one wishing advice.

John was trained at the Art Center and Allied Art School and is the holder of three honorable mentions and three sweepstakes prizes in the NRC Art show, and has sold many of his portraits and landscapes including one of Larry Sherry, Dodger baseball pitcher, and three paintings through the NRC Art shows.

"Our Club is enjoyed not only by novices, but by experienced artists who have been inactive and who feel this serves as an

excellent refresher course," John explained.

He states that although the Thursday sessions are devoted to life and portrait work, there will be summertime field trips for landscaping painting on weekends which will be also a family outing with potluck dinner in the afternoon. "We plan trips to local art shows and galleries and will take slides of our activities," he said.

John and Joe welcome new members and information is available through Personnel Activities, extension 2784.

Membership between Norair and Nortronics is about even with an overall total of 47 active members.

Members are now working toward the Annual NRC Art show to be held in May. John emphasized the fact that many of the NRC Art show winners, like himself when he first entered in 1951, had never sold a painting and were not in an art department.

"This is a wonderful opportunity as sometimes a surprise phone call from NRC has located someone who wishes to buy your entry. This happened to me when a former vice-president bought one and once the chairman of the board of directors purchased a painting of mine he had seen while going through the show," said John. "One meets very interesting people and makes very good friends who have the same interests."

BOY-HEALTH STRESSED IN NRC CUB PACK

Did your boy join the cub scouts yet?

It's not too late if he is not too old or too young, age requirements being 8 through 10 years.

Scouting, a year around, home-centered activity stresses boy-action, boy-achievement, boy-health, and boy-helpfulness.

Norair parents of potential cubs are invited to attend meetings, fourth Friday of each month.

Place is NRC Clubhouse, 12917 Cerise, in Hawthorne. Time is 7:30 p.m.

SKIERS HAPPY, MUCH SNOW IN THE MOUNTAINS

With snow all over the place, High Sierra places that is, the NRC Ski Club has launched a full-swing outing program.

Trips to Mammoth, reservation deadlines, and meetings will be on the following dates:

Trip April 20 and 21 with reservation deadline April 11. Meeting April 17.

Trip May 4 and 5 with reservation deadline April 25. Meeting May 1.

May 18 and 19. May 2. May 15.

June 1 and 2. May 23. May 29.



Northrop Norair News

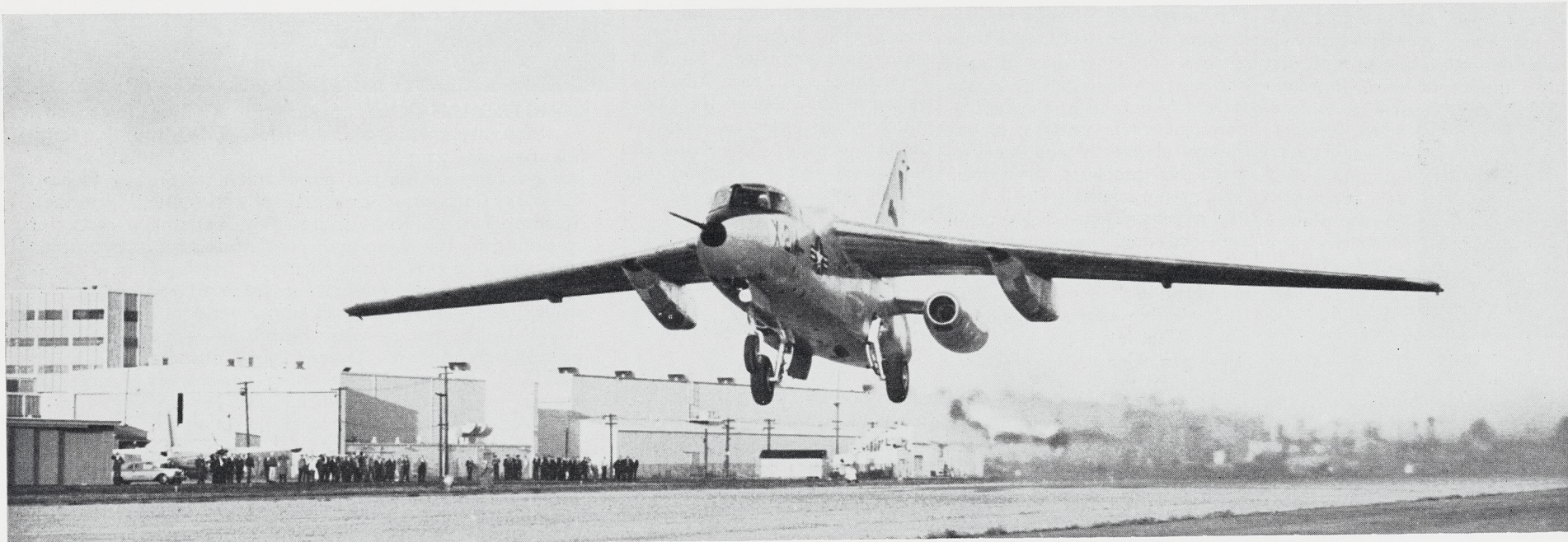
Issued biweekly by Norair Division of Northrop Corporation

Wednesday, April 24, 1963

HAWTHORNE, EDWARDS AFB, PALMDALE

SAN ANTONIO, EL PASO

LAMINAR FLOW CONTROL



X-21A Makes Uneventful First Flight to Edwards

It was a beautiful morning for LFC takeoff. Sun just up, rays golden out of the east. Weather mild. No wind. You look up. The

By Aerospace
Reporter

propeller on the anemometer atop the bamboo fleet hangar is not turning.

There was a crowd. Early morning passers-by. Northrop people — management, engineers, and mechanics who hand and heart followed the program from original concepts through R&D and the building of the test airplanes; the press including wire services, television, radio, and feature types; Air Force officials in their creased and natty blues.

A big helicopter trimmed in Air Force flight test red, rotors drooping in repose, was parked near the Norair flight office. Its crew walked slowly up the taxi ramp, were offered doughnuts. They waited apart, relaxed but ready, like young athletes before a game. Their presence seemed to add to the feeling and build up of the time. All business, important business, a very vital drill just minutes away.

Most everyone arrived about 5:15 a.m. There was just about time for a cup of coffee and a half before Jack Wells wheeled the X-21A off the Hangar 13 apron and onto the runway for an easy taxi run west to the Prairie end.

Things were going to happen fast this morning, April 18, 1963. Photographers checked their gear and their position.

Project men, radio communications, test engineers, and crew chiefs, settled to their posts in the tower.

The T-33 escorts in out of nowhere, banked steep, flashing over the field.

Conversation and small talk dwindled, stopped. People stepped out from the hangar apron for a better view and, their subconscious motivated by the significance of the event, moved closer together. And waited, silently.

The Air Force helicopter set its blades whirling like great knives slicing the air. You are surprised. You hadn't noticed the crew get back aboard.

Jack had turned the X-21A to the east. He had practiced the one-eighty during taxi trials. No problem.

Then, suddenly it was time to go. The sound of the two YJ-79-13 General Electric engines rolled up the field in a wave and the power in the sound built up with RPM until it seemed that the engine pods must burst, and then Jack and the airplane came through the wave of sound and then drove ahead of it, a complex of gleaming metal,

(Continued on Page 3)



THOMAS V. JONES

A BEAUTIFUL MORNING — U.S. Air Force/Northrop X-21A Laminar Flow Control demonstration aircraft, Norair pilot Jack Wells at the controls, lifts off Hawthorne Airport runway shortly after sunup last Thursday for maiden flight and ferry hop to Edwards. Big airplane, with an Air Force helicopter in its wake and T-33s at left in the pattern and ready for escort climbed rapidly, turned right toward Long Beach, then followed the coast line before cutting inland on an Edwards course. Although takeoff was approximately 5:50 a.m., spectators, the press, and many early rising Northrop people were on hand to watch the historic event. See story this page and additional photos, Page 3.

FREEDOM BOND DRIVE STARTS, GET ON BOND WAGON—SLOGAN

"Get on the Bond Wagon" will be the word at all Northrop divisions, subsidiaries, plants, and offices the week of May 6-12.

This is the week that Northrop joins the nation in the 1963 Freedom Bond campaign. Under the slogan "Get on the Bond Wagon" all facilities will beat the drum, literally and figuratively, for nothing less than 100 per cent participation by employees in the payroll savings bond plan.

National chairman of the aerospace industry effort to increase participation in the plan is Northrop Board Chairman and President Thomas V. Jones, who

Jones Elected Chairman of The Board

Thomas V. Jones, Northrop president and chief executive officer, has been elected by the board of directors to serve also as chairman of the board. Mr. Jones succeeds William C. McDuffie who died April 10.

Mr. Jones has been a member of the Northrop board since January of 1959. He was made president in May of that year.

Mr. McDuffie who entered the aerospace industry in the 1930's as a member of the board, Con-

(Continued on Page 5)

urged the support of every employee in backing the Company's part in the drive.

"The request for Northrop's participation comes from our biggest customer, the United States Government, through the Treasury Department," he said. "It is a patriotic duty, as well as an important matter of company busi-

ness, for each of us to give our whole-hearted support."

Dick Nolan, Corporate vice-president and Norair general manager put Mr. Jones' words into action last week as he kicked off the Division's portion of the drive within his own staff. The official company approach to the

(Continued on Page 4)



FOR FREEDOM BONDS—Northrop's Arleen Johnson and Pat Harrison model "Get on the Bond Wagon" bandoleer sashes that will be worn by Company mail couriers during the Bond Drive campaign, May 6 to 12.

Thank You and You

Returning to my desk after a spell in the hospital and convalescence at home, I face the really pleasant assignment of meeting the Northrop Norair News deadline once again.

Northrop is not only a good place to work "at". It is a fine place to be sick "from", and my first duty on this occasion

By John B. Clark

should be to write a "thank you" card to you and you and you. I am truly grateful for your solicitous interest shown during my illness. However, it would



take a tome of many pages to include everyone and I shall not attempt to do so. But, I know that you will forgive me if I give public recognition to two members of our personnel who performed outstanding service to me, Marie Tully and Mal Mountain. Here, indeed, are "merchants of mercy" and, to my way of thinking, their professional interest in every employee's well-being could be listed as most important to our Northrop life. Marie and Mal, who you know, man that high speed dynamo of good will, the welfare unit of the Personnel Activities group, went far beyond the call of their duty in speeding the recovery of your scribe.

Speaking of our welfare unit, it can be said that no day goes by in which some member of the Northrop family is not a recipient of its succor or encouragement, whether it be by a floral remembrance to those who are ill or a personal visit to help iron out any number of personal problems or to bring real help through the NOR-AID program to those facing serious financial difficulties. They wear the true heart of Northrop on their sleeves and their humanitarian effort reflects a fundamental policy of this Company — the recognition of the dignity of the individual.

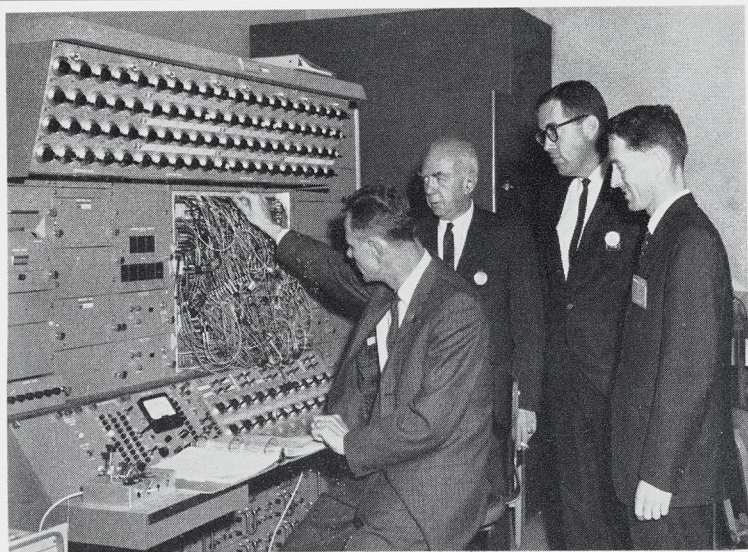
How does one go about thanking such Northrop stalwarts who helped so importantly to build the Clark morale, as Dick Nolan, Bob Miller, Bill Larrabee, John Alison, Evelyn Long, the Jack Mannions, and bless him, my boss, Tom McCarthy, Mell Peterson, the Larry Littrells; those two happy people, Madeline and Johnny Cristelli, the Jim Celonis, and Whitey Gillibrand.

I want those who sent get-well cards—all 721 of them—to know that they went a long way in keeping up the spirits, and I am grateful to the senders of each and every one of them. A man feels rich indeed, in the realization that he is working among thoughtful people who seem to make his problems their own. And, even a relatively small thing like a get-well card helps mend both body and soul.

I want to particularly thank my stand-in "guest columnists" for their fine efforts while I was away—Charlie Murray, John Breneman, George Forbes, Milt Kuska, and my longtime trusted associate, Dave Stadler. These gentlemen set a new standard for me to follow in reportorial efforts. Also, thanks to Rip Godfrey for his most welcome humorous messages that I shared with my hospital neighbors.

In my gratitude I do not want to omit the members of my immediate family for their love, patience, and round-the-clock attention extended over a long period of many trying days. From my beloved wife I received a gift, perhaps the greatest gift that one person can give to another—the gift of faith. Peggy taught me how to pray.

In a near term article I will be discussing with you "Northrop's Greatest Fringe Benefit". What would you say it is? It would be helpful to me to hear your opinions, and I shall appreciate your dropping me a line, stating what you consider to be the "greatest personnel benefit afforded Northrop employees". You may contact me in care of Industrial Relations and Security, Norair Division, Organization 1240, Zone 10.



ANALOG COMPUTER TECHNIQUES—Mr. Peter Benyon (at right), senior scientific officer of Australia's Weapons Research Establishment, recently reviewed Norair's computing and simulation capabilities of the Information Processing Center. Briefed by (from left) Bill Taylor and Ken Tuttle, specialists, and Ed Piper, chief, Mr. Benyon was especially impressed by the extent to which Norair's analog computers are used in solving T-38/F-5, VTOL, and other research problems. A tour of the new plant simulation facilities now under construction was conducted by Paul Jensen, chief, Research Laboratories. Mr. Benyon's visit was arranged by Lee Ohlinger, director, Information Processing Center.

Eyres Joins AIAA Group For Education

Charley Eyres, assistant to the vice-president, Technical, has been appointed a member of the American Institute of Aeronautics and Astronautics Educational Advisory Committee, it has been announced by W. H. Pickering, president of the AIAA.

Dr. Raymond Bisplinghoff, director, Office of Advanced Research and Technology, National Aeronautics and Space Administration is chairman of the Committee which meets twice yearly for the purpose of resolving all matters relating to education and student activities within the Institute.

The first meeting was held Monday of last week in Dallas, Texas. Main item of business on the agenda was to establish AIAA policies for student members of the Institute.

Other members of the Committee are Dr. Howard Sieffert, Stanford University; Dr. Ali B. Cambel, Northwestern University; Professor Charles Rodenberger, Texas A & M; Dr. David Hazen, Princeton University; Karl Palmer, NASA; Dr. John Hoover, University of Florida; Dr. Antoni K. Oppenheim, University of California, Berkeley; Charles Tiltner, Grumman; Dr. Richard B. Morrison, University of Michigan; Robert Tiedeman, Curtiss-Wright; Dr. H. Guyford Stever, MIT; Dr. William Sears, Cornell University.

SECRETARIES ATTEND NSA SYMPOSIUM

Eighteen Northrop secretaries from the Corporate office, Norair Division and NSL attended the Santa Monica and Airborne Chapters of the National Secretaries Association symposium at UCLA Sproul Hall held during the first week in April.

The group joined over 300 secretaries hailing from companies in the Los Angeles area.

The original planning for the symposium was the work of Margaret Boles, staff assistant, Corporate office. She selected subject matters for the speakers and also handled introductions on the platform.

Welcome address was by Margaret H. Thompson, associate in business administration, UCLA. Speakers included Gunther W. Klaus, assistant to general sales manager, Grocery Products Division, Purex Corporation, Ltd.; Edward Kelly, assistant professor of business and economics, San Fernando Valley State College; Arthur G. Shedlin, lecturer in business administration, UCLA; and Mary Holmes, lecturer in art, UCLA.

Northrop Norair News

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Published every other Wednesday
CHARLES BRADFORD, Editor

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Distinguished Visitor



CONGRESSMAN—One of Northrop Corporation's most illustrious ex-employees, Charles H. Wilson, Jr. (left), Member of Congress, 31st District, is presented with a framed copy of his old employment record by Richard R. Nolan, Corporate vice-president and general manager, Northrop Norair. The Congressman visited the plant for up-dating on the company's present and future programs and a tour of Hawthorne facilities. Employed as a time-keeper by Norair in 1951, he attained top ratings for ability, production, conduct and attendance. When told by Mr. Nolan that he was eligible for re-hire, Congressman Wilson replied, "Thanks, but I already have a job with 380,000 bosses—the entire population of the 31st District." The veteran politician served four terms as a State Assemblyman prior to his election to Congress in November of last year.

Congratulations for Two



BUSINESS AD MASTER—C. T. Laird, facilities engineer, right, is congratulated by Norair Manager Manufacturing Jack Mannion, upon receiving his master's at the School of Business Administration, University of Southern California, nights. Mr. Laird, worked for Northrop from 1951 to 1956, returned in 1957, for a total up to now of 10 years. At Norair he is in charge of development and administration of Facilities budgets, including budgets for Capital Improvement, Burden, Supply and Facilities Contracts.



BACHELOR OF SCIENCE—George Long, design specialist, center, on occasion of being awarded bachelor of science degree from UCLA is congratulated by Vice-president and Assistant General Manager Welko Gasich and Chal Strayer, supervisor, Mechanical Design. Mr. Long who majored in mechanical engineering burned the midnight oil for many months to earn the priceless sheepskin. He is a 10-year Norair man, and is now senior lead engineer in charge of airborne equipment for the T-38 and the F-5A and B. Both Mr. Laird and Mr. Long were aided in tuition costs and other college expenses by the Northrop Education Refund plan.

LFC Hard at Work in Edwards Test Program

The first U.S. Air Force Northrop X-21A now at Edwards after maiden flight from Hawthorne last week, is already embarking on its unique and special test program, it has been announced by Don Warner, manager, Laminar Flow Control Airplane Demonstration Program department.

At News presstime the airplane had been scheduled for the first test of an initial series of basic airworthiness checks. Configuration, flutter, flying qualities, powerplant and system installation will be thoroughly proven.

Under sponsorship of Aeronautical Systems Division of the USAF Systems Command, two X-21As are scheduled to demonstrate near-elimination of friction drag in flight with the Northrop-developed Laminar Flow Control system.

The LFC method is expected to increase range, payload capacity or flight endurance of large aircraft by 50 per cent or more.

Military payoffs could be longer-range, higher-payload logistics transports or missile-carrying aircraft capable of staying aloft for several days without refueling.

The flight test program is under the direction of Ray Bucher, chief, Laminar Flow Control Flight Test group.

The second X-21A, now being

completed in the Crenshaw high bay, is due for Edwards flight in July.

The first X-21's ferry flight to Edwards with pilot Jack Wells at the controls was entirely uneventful. (See Aerospace Reporter story, Page One.)

The X-21A project, as programmed by Northrop Laminar Flow Control Flight Test group, in addition to the airworthiness checks, will conduct system performance survey and performance optimization, will demonstrate performance improvement due to LFC, and provide system operational evaluation.

The LFC system performance survey will determine the degree of laminarization of the wing airflow which can be attained and the limitations, if any, imposed by lift coefficient, Mach number, Reynolds number, and aerodynamic and powerplant noise.

For selected flight conditions, the optimum suction distributions will be established.

The LFC operational evaluation will consist of specific tests to determine the effects of LFC operation on flight maneuvers, engine and suction system failures, and atmospheric disturbances such as turbulence, bugs, clouds, rain and ice.

In addition, the LFC system performance will be evaluated during a series of missions under simulated field maintenance conditions.

This is how LFC works:

1. Air passing over a conventional wing creates turbulence which causes friction drag. This in turn creates an unnecessary burden for the aircraft's engines to overcome.

2. If a very small portion of air is removed from the wing skin, the air particles travel smoothly in parallel (laminar) layers. Laminar flow removes 80 per cent of friction drag.

3. This thin film of air is removed from the wings of X-21As by sucking it through many paper-thin slots that run from fuselage to wing tip. The air is then diverted through pin-size holes into ducts that conduct it to small turbopumps. The turbopumps exert suction throughout the system and also expel the air overboard. The suction system was developed by the AiResearch Manufacturing Division of the Garrett Corporation.

The X-21As are not prototypes of operational aircraft. Their job is to demonstrate the practicality of Laminar Flow Control operation and maintenance, and to acquire data for application of LFC to current and future aircraft designs.

The X-21As originally were U. S. Air Force WB-66D weather reconnaissance aircraft, but they bear little resemblance to the WB-66D now.

Their wingspan has been increased from 72.5 to 93.5 feet, and wing area from 780 to 1250 square feet. Engines have been moved from under the wings to the aft fuselage to allow greater variation in test conditions. The turbopump suction system is mounted in two nacelles whose leading edges are streamlined into the wings.

The LFC wings have some

There at Dawn to See the Flight



FIRST ARRIVALS—Northrop President and Chairman of the board Thomas V. Jones; Colonel William J. Yates, chief, Programming Division, Directorate of Military Assistance, OSD/ISA; and Dick Nolan, Corporate vice-president and Norair general manager, are on hand.



ASD PROJECT MEN—Colonel R. A. Soukup, director, Defense Systems Programs Office; Major A. W. Tice, chief, Laminar Flow Control Project Office; with Walt Fellers, director, Long Range Planning. Location is Company flight office. Time 5 a.m. Weather is perfect.



STILL DARK — Warren Klauer, chief, Structures group; Welko Gasich, Norair vice-president and assistant general manager, Technical; Major Tice; and Dr. Wm. F. Ballhaus, Corporate executive vice-president, exchange before sunup greetings.

NSL Competes As Finalist In Bio Study

The Ames Research Center of the National Aeronautics and Space Administration has announced that General Electric Company's Missile and Space Division, Northrop Space Laboratories, and the Lockheed Missile and Space Company have been selected for negotiation of study contracts under Phase I of the bio-satellite program. These companies were among seven submitting proposals.

The contracts, each expected to be valued at about \$80,000, will call for a 6-week study on all aspects of the bio-satellite program with emphasis on the spacecraft. The study will include environmental control and missile support systems, spacecraft stabilization, re-entry and recovery systems, sensing, recording, and telemetry.

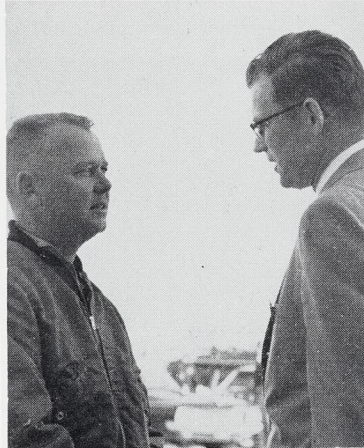
The bio-satellite program conceives of a recoverable, earth-orbiting, biological laboratory which would be able to conduct experiments in determining the effects of prolonged periods of weightlessness on living organisms.

Phase II of the program, hardware development, is not yet an approved program according to Ames Research Director, Dr. Smith J. deFrance. Such approval will depend on the completion of the above studies and evaluation by NASA.

astounding statistics. They contain 3.2 miles of slots ranging in width from 3/1000ths to 10/1000ths of an inch. Beneath the slots are more than 815,000 tiny metering holes.

The slot-cutting and hole-drilling are done by fully-automated machinery developed by Northrop during the 14 years the Company has worked on LFC. Most of the research during this period was sponsored by the Aeronautical Systems Division and its predecessor, the Wright Air Development Division.

BUY BONDS



FLIGHT PLAN—Jack Wells, Norair chief engineering test pilot and Don Warner, manager, LFC Airplane Demonstration Program department, review details for the important day. Mr. Wells got the first flight job done in 50 minutes.



COLONEL CLARK — Milt Kuska, deputy assistant general manager, Technical, and Colonel Charles W. Clark, Air Force Plant representative, relax following successful takeoff. They are listening to flight radio loudspeaker as it gives running commentary.



AIRBORNE—Colonel Yates, Mr. Nolan, and Robert R. Miller, Corporate senior vice-president, follow take-off of the X-21A. The big airplane with escorts on each wing turned south toward Long Beach then flew up the coast on a course to Edwards Air Force Base.



HAPPY PEOPLE—John Allison, Corporate vice-president, Customer Relations and pilot's wife and son, Pat (former Norair secretary) and John David, 10 months (in snuggler) smile happily in the early morning as all goes well aloft with the first LFC airplane.

Aerospace Reporter

(Continued from Page 1)
sweeping line and motion. And then they were airborne, easy at first and stable as the proverbial brick church, and one of the escorts was on their left wing, then the big whirly came but it was already outsped.

The X-21A, Jack Wells and escorts climbed as a team into the sun and you had to shade your eyes to see them and they made a big formation turn toward Long Beach and headed for the coast to pick up the flight plan of the day.

The loudspeaker on the wall of the flight office crackled out the talk of the flight, pilot to escort, escort to pilot, to tower, busy with reports and the first data of many air miles of data that the X-21A will feed to the computers in her job of demonstrating to the world the aerospace payoff of laminar flow control.

Jack Wells, Norair chief engineering test pilot had a good flight. He was back at the Science Center for debriefing at 8:30. The entire job was done in 3 hours and 15 minutes.



DR. PFENNINGER AND PILOT

and a suction pump in wind tunnel tests, he observed full laminar flow and low drag coefficients.

After joining Northrop, he extended full laminar flow to higher velocities, first in a slotted tube, later on a two-dimensional straight wing with slots on the upper and lower surfaces. Next, a slotted "glove" was installed on one wing of an F-94 jet fighter. With suction provided by an internal compressor, friction drag on the glove was reduced to one-fifth the normal value during nearly 300 flights. This work led to the X-21A program which began in 1960.

Headed for Careers in Aerospace



NEW AND REFRESHING APPROACH—Last week 82 local high school boys came to Norair for the first meeting of the Division's Aerospace Science and Engineering and Industrial Management special interest Scout Explorer posts. Here Norair Vice-president and Assistant General Manager Operations Bob Lloyd welcomes the boys and briefs them on the responsibilities of large industry. Seated at the speakers' table are Tom McCarthy, Norair manager, Administration and vice-chairman, Centinela District BSA; Robert McDonald, director, Organization and Extension, Boy Scout Los Angeles Area Council; Post Advisors, Charley Eyres, assistant to the vice-president, Technical; and Ed Nolan, general foreman, Process, Paint and Upholstery. Boys wishing to join program should call Personnel Activities, OR 8-9111, extension 2784.



INSIDE — Division doors open to admit for first time dedicated teenagers who will observe aerospace work firsthand.



RAPT ATTENTION — Boys are intent on how special interest posts will be run. Young lady, Dorothy Cobb, Morningside counselor.



MANAGEMENT — Mr. Nolan describes particulars of Industrial Management post. Groups will meet at the plant twice a month.



LISTENING — Spacemen of the future are told about the many Norair projects. Boys look forward to discussions with project men.

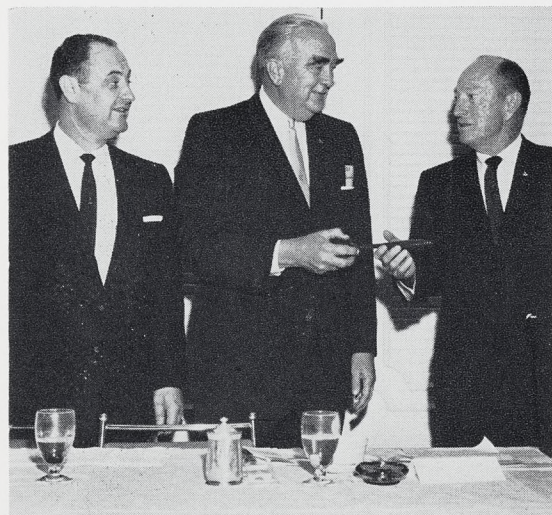


THE T-38—Tour of the T-38 assembly line was interest high spot during first evening here. The boys already know their airplanes.



THE OFFICE—T-38 cockpit, a fascinating place, gets O-O during tour. Carl Yates, chief, Manufacturing Control, explains.

Gavel Exchange and M-O-M



M-C PRESIDENT FOR 1963—It's official as Management Club president, 1962, Al Binsacca, left and William Larrabee, Corporate vice-president, Legal, center, bestow traditional badge of office on newly elected 1963 M-C prexy Ed Laski. Ceremony was at Airport Marina Hotel.



AND A HIGH HONOR — Mug-of-the-Month honor for April and May went to Lew Nelson, director, Test. Presentation was made by Milt Kuska, deputy assistant general manager, Technical. M-O-M trophy board will repose in Mr. Nelson's office until next member is so honored.

Streamlined Meeting at Norair Aids BSA Program

A new movement in the scouting field—"special interest" explorer posts—was given a large boost in the Centinela Valley with the launching of two posts sponsored by Norair Division.

The posts bring together boys with specific interests and men with records of accomplishment in two special fields—industrial management and aerospace science and engineering.

The kickoff meeting, held at the Engineering and Science Center, was attended by scout executives, school officials, Northrop administrators and 82 local high school boys who will take part in the explorer program.

Activation of the explorer posts followed closely the recent streamlined scout communications meeting attended by over 70 members of the Centinela District. This gathering served to point up all phases of Valley

scouting from explorer to cub level. Host was Norair Manager Administration Tom McCarthy who is BSA District vice-chairman.

The meeting, the first full committee session held in eight years, defined 1963 scout objectives and served as a platform for the announcement of the special interest explorer post movement.

The explorers at last week's opening meeting were welcomed by Bob Lloyd, vice-president and assistant general manager, Operations.

Following remarks by Robert McDonald, the man responsible for special interest exploring in the Boy Scout Los Angeles Area Council, the group split into separate post meetings for registration and explanation of purpose, approach and scope of the explorer program.

Bond Drive Timetable

April 26:

Division general managers will receive a memorandum from Thomas V. Jones, Northrop president and chairman of the board, carrying official notification of the Freedom Bond campaign.

On the same day at Norair, the first Freedom Bond promotional materials will be placed in the hands of all department managers. Each manager will have a complete tab run of personnel under his jurisdiction containing bond deduction information; computer cards which will be used for bond signups; plus facts and figures from the U. S. Treasury on bond investment.

April 29:

Supervisors will be called by their managers and chiefs to pick up computer signup and deduction cards for distribution to all personnel.

April 30:

Division general managers will formally notify supervision on the details of the Freedom Bond drive.

May 1:

All present bond buyers will receive a letter from Mr. Jones enlisting their assistance in obtaining new subscribers.

May 3:

On this day, payday, personnel will receive a Freedom Bond message in their pay envelope. Northrop Corporation is asking everyone to participate, with the goal being 100 per cent. Deduction may be as low as 50¢ a week.

Also, Mr. Jones will issue an announcement to all personnel that the Freedom Bond campaign will start on the next working day, Monday, May 6.

May 6:

The campaign starts at 12:01 a.m.

Personnel Activities will have installed a bond-o-meter to keep personnel advised as to how we are doing in the drive for 100 per cent.

Freddy Wolfe will feature "bond burgers" in the cafeterias and catering trucks.

May 8:

A big day for Freedom Bonds at Norair. During the lunch hours a gaily decorated "bond wagon" with Michael Paige and his Dixieland orchestra plus a bevy of Freedom Bond cuties will parade and play and signup bond buyers throughout the areas.

GET ON THE BOND WAGON, will be the slogan.

May 10:

Campaign officially ends. However, if 100 per cent hasn't been reached supervision in all probability will request another week to put the drive over the top.

Bonds

(Continued from Page 1)

drive this year is "leadership through supervision," and Mr. Nolan demonstrated this by initiating the first official signups of the campaign among those at the meeting.

"The corporate goal of 100 per cent participation leaves no question as to our responsibility here at Norair," he said. "It is our duty to sign up not just to express support of our government, but to help the Company show—through maximum performance—its ability to respond

to an important request from its customer."

The Northrop "Get on the Bond Wagon" theme will be much in evidence at Norair during the peak of the drive. On May 8 from 11 a.m. to 1 p.m. a symbolic Bond Wagon complete with Michael Paige's Dixieland band will appear in luncheon areas to spur interest in the drive.

Present Freedom Bond payroll deduction savers will be given a label button reading "I'm on the Bond Wagon" at the start of the drive. All other employees will receive a similar button as they sign up for the plan.

BBSF Classified Ads

BBSF classified ad service is provided free of charge to all Northrop Norair personnel.

Ads for agencies, commercial enterprises and private businesses are not accepted.

Deadline is noon Wednesday, one week before publication.

FOR SALE

CHEVROLET, 1956, new tires, \$600. 675-0010. A
TV 19" Motorola, portable, \$115. DA 3-9352. A
FORD, 1959 Galaxie, 4-dr., h/top, r/h, \$1150. DA 6-4899. A
BOAT, 15', trailer, 35 hp Evinrude, fully equipped. \$495. 676-6360. A
MOVIE CAMERA, Eastman 16mm magazine, case & Eastman titler, \$39. ST 8-9709. A
PLYMOUTH, 1951, 2-dr. sedan, \$150. SY 9-1385 after 6 p.m. A
FORD tri-power, fits 312 cu. in. blk., \$45; cam & kit, Clay Smith \$20. OR 7-8775. A
RAMBLER, wagon, 1961, 4-dr., p/s, new tires, \$1900. 677-8161 or WH 8-4346 eveninas. A
V-8 ROADSTER, 1932, full race Mercury eng., 59A block, special equip., \$950. PL 4-7861 after 5 p.m. A
OLDSMOBILE 98, 1955, 4-dr. Holiday, full power, \$400. 675-2962. A
MODEL T, 1923, 1 1/2-ton truck, \$450; camper, 9', birch int., \$495; MG TD, 1951, \$495. 867-1476. A
HOUSE, 3-bdrm., den, 1 1/2 baths, corner lot, \$29,900. OR 1-4104. A
GUITAR, jumbo Gibson, concert-type, \$110. OR 1-3455. A
FORD, Fairlane 500, 1962, V-8, 4-dr., r/h, \$2300. DU 4-5615 after 5 p.m. A
PICKUP, 1951 Ford w/1953 Mercury eng., \$350. 323-1774. A
FORD, V-8, 1955, 4-dr., r/h, \$395. DA 9-5696. A
OUTBD. MOTOR Scott, 7 1/2 hp, \$160. DU 4-4017 after 5 p.m. A
BEDROOM SET, walnut, 5-yr.-old, \$35; wool rug & pad, 9x12, floral, \$10; table, folding-type, & 3 chairs, \$10. 370-2847. A
BEDROOM SET, blonde, \$50; dining-room table & 6 chairs, \$60; stove, O'Keefe & Merritt, \$35; refrigerator, Crosley, \$50; reclining chairs, \$20 ea.; 3 tables, blonde, \$15; 3 lamps, \$15; evening gowns, 3, size 8, long \$15; short, \$8; short, size 12, \$8; house slippers, long, \$4; short, \$2. OS 5-6473. A
VOLKSWAGEN, 1962, fully equipped, \$1745. DA 9-6039. A
BICYCLE, Schwinn Derailleur w/Campagnola gears, 10-spd., \$50. OR 2-1716. A
ROCKER, child's, upholstered, \$4; organ, Magnus, ivory, 6-cord, 15-keyboard, \$20. 371-9651. A
DINING ROOM SET, Duncan Phyfe, \$75; double mattress & springs, \$10. OS 5-2159. A
HEARING AIDS, 2, Silvertone, all transistor, \$25; Acousticon, \$15; telephone amplifier, Clarafon, \$25; hair dryer, lady's Sunbeam, \$10; TV, GE, 14", port., \$50; refrigerator, Cold Spot, 10 cu. ft., \$75. PL 1-0984. A
VOLKSWAGEN, sedan, 1959, 39,000 mi., \$995. 329-2076 after 6:30 p.m. A
FORMALS, 3 flou-lenath, size 16, \$12 ea.; washer Maytag, ringier-type, \$10; violin, adult-size, \$10. EX 7-2055. A
CADILLAC, Coupe De Ville, 1955, power equipped, \$550. DA 4-7059. A
STENO TYPE MACHINE, carrying case & course of study, \$35. DA 4-9047. A
CHEVROLET, 1959, Impala spt. coupe, 2-dr., h/top, V-8 eng., p/steering & brakes, approx. balance \$1300, \$250 & take over \$58.20 mo. pymt. OS 9-5570. A
BOAT, 10'x52" beam, car-top size, w/rack, 2 inlaid canoe paddles, 4 life preservers, \$75. PL 6-9775. A
CHEVROLET, Biscayne, 1959, r/h, 283 cu. in., cam & lifters, \$900. 639-1635. A 1635. A
CHEVROLET, 1950, \$75; bicycle, girl's, \$15. FR 9-2068. A
SKI BOAT, 16', glassed inboard w/trailer, 1941 V-8 eng. w/dual manifold, lots of extras, \$775. FA 8-4188, after 5 p.m. or weekends. A
HOUSE, 3-bdrm., 1 1/2 baths, pool, carpets & drapes, Palos Verdes, GI 4 1/2 %, \$39,000. FR 8-4996. A
SKIS, 7' Heads, Cubco binders & poles, \$60; lot, choice level, Salton Sea, 73' x 139', streets, palm trees, water in, \$3390. OR 3-1189. A
OLDSMOBILE, 1956, 2-dr., h/top, r/h, full power, \$500. 870-2301. A
CAMERA, Reflex, \$22; desk & chair, \$20; typewriter, Royal, \$25; patio lounge & pad, \$5 ea.; manale, \$10; folding bed, \$5; table & chairs, \$10; pipe fitting tools, \$40; pipe wrenches, 18", \$2.50; 24", \$4; 36", \$5; stoves, wood-type, \$3.50 & \$20; fishing tackle, rod & reel, \$10; garden tools, 50¢ to \$3. OS 6-5253. A
TRANSMITTER, Heathkit DX 100, \$95; record changer, Collero, GE pickup & diamond needle, \$18; tuner, AM-FM Harmon Kardon, \$24. OR 0-4490 eveninas. A

FOR SALE

SECTIONAL, 2-pc., custom made, \$50. DA 9-9333. A
ACCORDION, 120-bass, Blair, \$125. DA 4-5449. A
WALL TENT, J. C. Higgins, 10'x20'x7, ridae pole, \$125. FR 1-3769. A
WASHER-DRYER, O'Keefe & Merritt, \$75. OS 5-1347. A
ACCORDION, Italian make, full size, \$85; 22-ga. rifle, single shot, & scope, \$18; BB gun, \$6; boy's suit, dark grey, \$6. 676-4439. A
KITTENS, Siamese, pedigree, \$25. OS 5-1842. A
ENCYCLOPAEDIA BRITANNICA SET, w/walnut bookcase, World Atlas, dictionaries plus Yearbooks for 1961, 1962 & 1963, \$168. FA 1-1284. A
HOUSE, 2-story, Cape Cod, 3-bdrm., rumpus room, basement, 2400 sq. ft., 80% financing, \$42,250; dining rm, set, maple, \$50; Ford, 1951 2-dr. custom, r/h, stick, \$185; Chevrolet Impala coupe, 1959, r/h, p/s, Powerglide, \$1585. 433-1406. A
DODGE, 1958, convert., all power, \$475. OS 5-5018. A
SECTIONAL, 2-pc., foam rubber, \$20; rattan furniture, 3 chairs, 2 tables, blonde, \$40. FR 5-5237. A
VOLKSWAGEN, 1962, trans. radio, w/w tires, \$1675. 472-3518. A
BOX SPRING & mattress, \$35. OS 6-3616. A
OLDSMOBILE, 1954, 2-dr., new w/w, r/h, \$295. OS 6-3110. A
STOVE, \$30. 672-7951 after 5 p.m. A
KARMANN-GHIA, 1961, w/air cond., seat belts, \$2150. FR 8-7577. A
VACUUM CLEANER, Hoover, \$40. 833-0217. A
HONDA, Super Hawk 30, 5 cc, \$450. 374-6331. A
OPEL, wagon, 1959, \$619. FR 6-6884. A
GAS RANGE, Tappan, \$25. FR 5-8536. A
GRAVE, double interment, Inglewood Park Cemetery, El Portal, \$600; saw, 1-handle, crosscut, \$2.50; grass scythe, \$2.50; roll-a-way bed, 3/4-size, w/inner-spring mattress, \$18. 375-4593. A
HEATERS, elec., auto, Toastermaster deluxe w/thermo control, \$19.50; GE radiant, \$6.50. OS 5-7938. A
RADIO, 9-trans., Packard Bell, FM-AM ant., w/case & earphones, \$55; davenport, 6', \$75; coffee table, leather-top, mahogany, \$10. VE 7-3671. A
RIVERFRONT LOT, So. Colorado, hunting & fishing, 6700' elevation, \$250 dn., \$1000. TE 3-9118. A
LOUNGE CHAIR & ottoman, brown vinyl plastic, foam rubber, \$75. 324-7377. A
OLDSMOBILE, 1951, sedan, radio, \$150. FR 8-1496. A
DINETTE SET, Virtue Bros., \$20; manale, Thor Gladiron, \$25. FR 7-3487. A
LIVING ROOM SET, \$50; studio couch, \$20; stove, \$50; wheelchair, \$35; sewing machine, \$20. EX 2-2628. A
BAR, 5', maple, footrail back-bar, 3 stools, \$50. 837-0952. A
TOY POODLES, AKC reg., black, 2 females, \$85, male, \$100. PL 4-3665. A
BOAT, 18' cabin cruiser, fully equipped, 40 hp elec. start, Evinrude & trailer, \$1600. 430-5543. A
BOAT, 15', sport fisherman, home made, cabin, Johnson 30 hp motor, trailer, \$500. 371-9730. A
FALCON FUTURA, 1962, Fordomatic, r/h, w/w, 4500 mi., \$1800. 676-6043. A
TAPE RECORDER, Concertone w/reverse-o-matic, \$450. EX 1-4860. A
TRIUMPH TR3, 1957, h/top, o/drive, \$1095. DA 7-0304. A
HOME, custom built, 1750 sq. ft., landscaped, 1/4 acre, P. V. Peninsula, 10% dn., \$33,300. FR 7-2239. A
SLEEPING BAG & air mattress, 3 1/2 # Acrylan, hvy-duty, Mt. Washington conqueror bag, size 36"x82" w/108" zipper, \$30. FA 8-9377. A
CADILLAC, 1954 Coupe De Ville, full power, new tires, \$695. OR 1-8946. A
MOTOR BIKE, Spring cycle, \$75; bicycles, boy's, 26", English light wt. racer, \$20; 20", \$12. PL 5-4497. A
METRO, 1960, h/top, \$695. VE 7-4237. A
MERCURY, convert., 1958, all power, orig. owner, \$950 or best offer. DA 9-4576 after 6 p.m. A
COMP. TESTER, Widenhoff, \$10; cyl. gauge, Ames, \$15; ridae reamer, Lisle, \$15; wrench, Black Hawk, torque-flash, \$10; socket set, Bonney, hvy duty, 1 1/2"-1 1/2", \$5; wheel puller, 3 sets jaws, \$5; china closet & dining table, maple, \$65 or sell separately. OS 6-4388. A
AUSTIN HEALEY Sprite, 1959, 1-owner, \$850. 671-1130 after 4 p.m. A
GREAT BOOKS of the Western World, Britannica, set of 54, \$150. 671-8719. A
BABY FURNITURE, lge. wardrobe-chest, natural ash, \$30; crib, \$10 or both for \$35. GE 0-1245. A
AUSTIN HEALEY Sprite, 1959, \$950. 329-3949. A
LAWN EDGER, elec. w/new extra blade, \$5; file cabinet, 4-dwr., wooden, \$4; exercise bike, \$15; reed fence, 1 roll, \$1.50. DA 9-6413. A
MODEL A, 1930, closed cab, 1/4-ton pickup, could be restored, \$225; Ford, V-8, 1958, auto, trans., r/h, w/w tires, \$595. FR 1-2948. A

Cost Estimating Adds to Know-how



MACHINED PARTS COST CLASS—Twenty-five Norair Cost Estimating folk proudly receive Industrial Training certificates upon completion of 20-week course in fundamentals of machined parts estimating. Photo taken in Administration Building theatre shows, from left, front row, D. F. James, A. T. Sullivan, G. W. Smith, A. L. Trammell, E. D. Peden, F. A. Kibler, C. E. Lees, Joe Seman, supervisor, Cost Estimating's Time Standards unit, course instructor. From left, center, R. W. Rinehart, R. P. Wilson, F. M. Adams, G. A. Bell, Page Jennings, J. F. McKenzie, F. L. Romero, and K. L. Anderson. In rear, from left, E. L. Horton, O. F. Stadler, jr., C. L. Walker, J. G. Hoffacker, J. E. Werner, R. C. Joslin, G. L. Barlup, R. A. Howell, and P. C. Shrimp. Not in photo, Bert St. Gane.

FOR SALE

BICYCLES, Schwinn Superior, 15-spd., \$90; boy's, 24", \$10. 371-6775. A
HOME & INCOME, 3-bdrm., 1 1/2 baths, fenced yard, duplex, aarb, disposals, birch cabinets, 3-car garage, 6 min. from Northrop, \$32,500. PL 4-1964. A
DINETTE SET, 4 chairs, yellow, \$25. FR 7-1094. A

WANTED TO BUY

HILLMAN STATION WAGON, under \$400. 378-7920 eveninas. B
RECORD PLAYER or Hi-Fi; also 10" radial table saw & attach. 324-7174. B
TRUMPET or cornet, child's, reasonable. OS 9-4342. B

FOR TRADE

FORD, Tudor, 1951, r/h, auto, trans., trade for 1949/1950 Ford convertible. DA 4-8663. C

RENTALS OFFERED

APTS., sparkling new, carpeting, drapes, built-in range & oven, disposal, sliding glass door to private patio, pool, in foothills of Rolling Hills Estates near Crenshaw and 101, adults, 2-bdrm., \$125 mo. 1-bdrm., \$100 mo. 326-0474. E
DUPLX, 2-bdrm., upper, unfurn., 1 child OK, \$87.50. PL 4-4556 after 5 p.m. E
ROOMS, men only, non-drinkers, cooking privileges, any shift, \$7 & up per week. Box 701. E
APT., unfurn., 2-bdrm., lower, walking distance to Northrop, adults, \$115 mo. 772-1992. E

LOST

BLUE WHITE ZIRCON STONE, 1 1/2 carat, from man's ring in vicinity of cafeteria or Engineering Center. 754-0660. J
GLASSES, prescription, gray frames, Calabar lens, at Plant 1 or Engineering area, ext. 2410, 2540, FR 8-1969. J

FOUND

MAN'S RING, owner call ext. 1589 & identify. ED 9-8944. K

PERSONALS

SINCERE APPRECIATION for the expressions of sympathy & kindness during the loss of our beloved mother, grandmother & great-grandmother, JOE, LOUIE CRIBBS & FAMILIES. L
SINCERE APPRECIATION for expressions of sympathy & flowers from NRC during the loss of our father, MICHAEL KENNEDY. L
THANK YOU to Dale's friends & Northrop officials for their thoughtfulness, memorials & expressions of sympathy at a time when they were deeply appreciated. DALE R. BRANCHFLOWER & FAMILY. L
SINCERE APPRECIATION for expressions of sympathy & kindness shown during the loss of our beloved husband & brother, VIRGINIA & RUTH LINDSTROM. L

OPENINGS in A & E Flying Club, \$200 initiation fee, Cessna 140, \$4.50/hr., 170. \$6.50/hr., 172. \$7/hr.; Bonanza, \$9/hr.; Meyers 200A, \$12/hr.; prospective applicants invited to regular meeting at Product Display Bldg., Wed., April 24, 7:30 p.m. DA 4-2992 after 5:30 p.m. L



COST ESTIMATING—Cost Estimating group, on "graduation day" was congratulated by Bob Lloyd, vice-president and assistant general manager, Operations, seated, and R. M. McNamara, manager, Contracts and Pricing department, speaking. Seated next to Mr. Lloyd is E. P. Robinson, director, Cost Estimating. Classes, which were given off hours were arranged by Industrial Relations' Education and Training group.

Chairman of the Board

(Continued from Page 1)
solidated Vultee Aircraft Corporation, became a director of Northrop in 1943. He served as chairman since 1954.

All of his business life, Mr. McDuffie has been associated with the petroleum industry.

He took his first job in 1907 in the oil industry with Caribou Oil Company as a roustabout and well driller in the San Joaquin Valley oil fields, and worked his way up to become a top oil industry executive. From 1914 to 1925 he was in charge of production for the Shell Oil Company of California, serving as vice-president and director of the company. It was under his direction that the famous Signal Hill Oil Field was discovered in the early 1920's. He was general

manager of production for the Royal Dutch Shell group from 1925 to 1928 and president of Pacific Western Oil Company from 1928 to 1931. For the next six years he served as receiver for Richfield Oil Company and later served as chairman of its executive committee. As an independent oil operator, he founded the Wilmington Gasoline Company, which later became part of General Petroleum Corporation. He has been chairman of the board of Mohawk Petroleum Corporation since August 1945.

Stated Mr. Jones, "With Bill McDuffie's passing, I have lost a very dear friend and associate. His association with Northrop goes back to the very beginnings of the company. He was known personally and affectionately by a great many of our employees. To the board of directors and the management of the company his strong character, his high principles, his even tempered judgment and his warm humanity were a pillar of strength and leadership. Each of us will miss him deeply and personally."

FOR SALE OR TRADE

PISTOL, Walthers .32 auto., 2 clips, leather holster, \$25 or trade for good .22 cal. revolver, Frontier model. GE 1-4233. M
TRIUMPH, 1962 TR-3 Rdstr., 9-mo-old, 7700 mi., w/w tires, all-transistor radio, htr., \$2165, \$750 dn. & take over \$65 mo. payments or equiv. value in used car. TE 3-3944. M



RIDES WANTED

7 a.m. — 3:45 p.m.

MANHATTAN BEACH BLVD. & HAWTHORNE, Lawndale, Kathleen D. Plumb, ext. 4288.

8 a.m. — 4:45 p.m.

ARTESIA BLVD. & YUKON, Torrance, Rochelle Krause, ext. 1247, DA 3-6017.

WESTERN AVE. & CENTURY BLVD., Los Angeles, Edna Ely, 2151, PL 5-8369.

PACIFIC COAST HWY. & WESTMINSTER BLVD., Westminster, John Fisher, ext. 616, 662.

RIDES OFFERED

8 a.m. — 4:45 p.m.

PACIFIC COAST HWY. & WESTMINSTER BLVD., Westminster, John Fisher, ext. 616, 662.

Air Force Has Film Telling Seatbelt Why

A dramatic lesson on life is portrayed in the U.S. Air Force's new film story of a man who died sitting on his life insurance.

Treating a sordid subject with skill and creativity, a 10-minute, 16mm color motion picture, "Seatbelts, Your Life Insurance," has just been released for both public and Air Force review.

The film points out, through comments of the deceased, how a beautiful day and life suddenly terminated for an Air Force major who wouldn't think of piloting his T-37 jet trainer without first buckling his seatbelt, but who knowingly sat on the one in his earthbound automobile.

The action-packed cinema was shot at various California locations by the Air Force's Air Photographic and Charting Service under monitorship of the Office of Deputy The Inspector General, USAF, Norton Air Force Base, Calif. Designated Film Report 279, it can be booked for showing through any Air Force base film library.

Part of the narration and action was furnished by Maj. Bob White, X-15 test pilot at Edwards

BUY BONDS

AFB, Calif. Other fast-moving scenes were enacted by instructors for the California Highway Patrol.

Col. John Stapp's demonstration of rocket sledding is shown to illustrate how use of a shoulder harness in addition to seatbelt can prevent injury equivalent to that of striking a barrier at 60 miles per hour.

The film was written by Harold P. Kent, directed by Walter L. Gilmore, and produced by Lt. Robert Wiemer of 1365th Photo Squadron, APCS, Orlando AFB, Fla. Ralph Riley, chief of ground safety for the Air Defense Command, Ent AFB, Colo., was technical advisor and Fred Budinger, traffic safety specialist for the Ground Safety Division, Deputy The Inspector General, served as

NRC TRAVEL CLUB GETS SET FOR 1963 SEASON

The NRC Travel Club is now blueprinting their activities for the 1963 Gadabout year, it is announced by Howard Cornelius, commissioner.

The very first business on the tours agenda will be the May 2 meeting at the Parish House, 7:30 p.m. where details of the Hawaiian trip, December 21 to January 1, will be discussed. Cost is pegged at \$398 by jet.

Two weeks later, May 16, another meeting will be held at the Parish House to talk about the

Mexico trip which is also scheduled for December 21 to January 1. Cost for this one is the same, \$398.

A Las Vegas holiday for June 21, 22, 23 at \$60 each is on the travel bill-of-fare.

There will be another holiday outing for Catalina, September 6, 7, and 8 at \$30 a person.

The big effort, however, will be the European trip scheduled for three weeks, September 14 through October 6 at a cost of \$945.

"We want to fill all reservations early," states Howard. "The sooner our lists are completed the better the trips will be."

All Northrop people who intend to take part in the Gadabout tours should attend Club meetings for complete details.

CHARM CLASSES AT CLUBHOUSE OFFERED BY NRC

"Charm at Work" is the name of the up-coming series of courses to be offered Northrop ladies, it has been announced by Fred Armstrong, NRC president.

Charm at Work instructor will be Yvonne Black, the fascinating lady who conducted the self-improvement phases of the Company's recent secretary orientation program. Miss Black's accent will be on you, your wardrobe, grooming, attitude, ability to communicate, appearance, posture, and decorum with guidelines to conduct complete self-evaluation. There will be live demonstrations of hair styling, make-up and modeling.

The class sessions are scheduled two a week for an 8-week period. Cost for the entire course is \$16. Time will be 5:30 to 7:30 p.m., Tuesday and Wednesday starting April 30 and May 1. Class limit is 25. Meeting location is the NRC Clubhouse.

Charm at Work registrations are being taken at Personnel Activities.

GUN CLUB SHOOT THIS WEEKEND AT ANGELUS

Bob Bagby, commissioner, NRC Trap and Skeet Club, has announced that this weekend, Saturday, April 27, the second trophy shoot of the year will take place at Rancho Angelus Gun Club, 19140 South Main in Gardena. Time is 12 noon.

Bob says there will be 50 skeet targets and 25 each 16 yard and international trap targets for an aggregate of 100 for the day. Trophies will be awarded each class, "AA through D."

SET CLOCKS UP

Daylight Saving Time will be in effect at 1 a.m., April 28, a Sunday morning. It will continue all summer. We will return to Standard Time on October 27, again a Sunday morning.

Set clocks forward one hour. Norair clocks will be set up between the end of the Saturday second shift and the beginning of the first shift, Sunday morning.



WHY NOT—Be a coin collector. It's fun, fashionable, and fascinating, say Fred Armstrong, NRC president and E. C. Bentley, Coin Club commissioner. The group meets fourth Monday of each month, 7:30 p.m., NRC Clubhouse.

Hikers and Packers Will Climb San Geronio Peak

The NRC Hikers and Packers, Bob Van Allen, commissioner, just returned from two very successful trips in Death Valley, are now pointing to San Geronio wild area for next Saturday and Sunday, April 27 and 28.

The Club is scheduled to depart Poopout Hill, Saturday, 8 a.m. They will spend Saturday night at Dollar Lake. Sunday morning they will climb San Geronio, 11,500 feet.

San Geronio, the highest peak in Southern California, is now the center of a boiling controversy in the Wilderness Bill. Bob states that this trip will serve as an excellent platform for outdoor lovers to get firsthand information on the pros and cons of the argument.

The trip is essentially for men and boys, the lower age limit being 12 years of age and Bob would like to make it a father-and-son affair. If there are no sons in the family, let Bob know and he will see if he can make teams for everybody.

The trip is individual commissary, that is bring your own food. There will be transportation pools.

Bob will be the leader and his two assistants will be Evert Ellis and Lynn Holcomb.

It is strongly recommended that Friday night, May 27, be spent at Barton Flats.

Another event for Hikers and Packers has been set for Memorial Day weekend.

This is a fishing trip to Little Lakes Valley, northwest of Bishop

RIDING CLUB TO STAGE ALL-DAY MEMORIAL RIDE

The NRC Riding Club, Tex Statley, commissioner, is to stage an all-day ride Memorial Day, May 30.

The Saddle Pals will start from the Arroyo Seco Stables in South Pasadena at 8 a.m. They will take the trail into the Angeles National Forest and return along about 4 in the afternoon.

A "brunch" stop at the Rose Bowl Restaurant will help solve those appetite pangs sure to be generated by the great outdoors.

All Northrop families are cordially invited.

The next regular ride will be Saturday, May 4 at 10 a.m. from the Ride Awhile Stables at 1850 Riverside Avenue in Glendale.

in the High Sierra primitive area. Height is 10,500 feet. Base camp will be at Long Lake which is near Mount Morgan. Boys should be accompanied by a parent or responsible adult. This will be central commissary. Transportation pools are being arranged.

The trip requires one day of vacation, May 31, to complete the four-day weekend. All participants are asked to check in with Personnel Activities, extension 2784 by May 9 with names and organizations and also attend the Hikers and Packers meeting on May 9 where details will be outlined.

Leader for this trip will be Dale Huss, assistant leader will be Gordon Madison.

NRC Blood Bank Does Much More

The blood contributed to the Northrop blood bank does much more than generally realized. It provides the traditional protection for Northrop people and their families, whole blood in case of surgery, hemorrhage, or accident—but there's an extra dividend—blood derivatives.

Plasma—for treatment of shock and burns.

Red Cells—for treatment of anemia.

Fibrinogen—for use in severe cases of hemorrhage in certain complications of childbirth.

Antihemophilic Plasma—for treatment of hemophilia.

Vaccinia Immune Globulin—for treatment of smallpox vaccination complications.

Gamma Globulin—to combat measles and hepatitis.

Serum Albumin—for treatment of shock and certain liver and kidney diseases.

Frozen Plasma—for treatment of coagulation defects.

Although it takes several pints of whole blood to produce a single unit of many of these derivatives, the Northrop blood bank requires only one blood credit for each unit the doctor prescribes.

The next blood bank visit will be on May 22 at the Product Display Building between the hours of 7:30 a.m. to 12:30 p.m. Get donor application forms from department clerks or from Personnel Activities office.



Northrop Norair News

Issued biweekly by Norair Division of Northrop Corporation • Tuesday, May 7, 1963

HAWTHORNE, EDWARDS AFB, PALMDALE

SAN ANTONIO, EL PASO

GET ON THE BOND WAGON

Tomorrow during lunch periods:

MICHAEL PAIGE AND HIS DIXIELAND BAND WILL MARCH AND PLAY . . . A BEVY OF BOND-O-GIRLS WILL MAKE SIGNUP EASY . . . PROGRESS ANNOUNCEMENTS ON BOND CAMPAIGN WILL BE MADE . . . CLEM ELLER, U.S. TREASURY OFFICIAL, WILL TALK ON BOND ECONOMICS . . . NEWS PHOTOGRAPHERS WILL ROVE . . . CAFETERIA WILL SERVE "CAMPAIGN STEAK SANDWICH" . . . HEAR DIXIELAND MUSIC—SAINTS GO MARCHING IN, STOMPIN' AT THE SAVOY, MUSKRAT RAMBLE, ST. LOUIS BLUES, MANY MORE . . .

Norair Division has promised Uncle Sam all-out participation!

Top U.S. Science Team to form Northrop Norair Research Council

Northrop Norair has just recently brought together under contract a consulting and advisory team of leading scientists and educators to serve the Division as a Technical Research Council. It has been announced by Vice-president and Assistant General Manager Technical Welko Gasich.

Composed of six men, foremost in their respective fields and all from advanced institutions of aerospace learning in the United States, the Research Council will meet with Mr. Gasich at specified intervals, tentatively twice each year, to review the complete spectrum of Norair research and development activity.

Their deliberations will be of the highest order. They will advise as to new fields, discuss current program status and access Division concept and approach.

Interim meetings will also be called, either the entire Council, or with individual members should the need arise.

Council membership consists of:

Professor Seymour M. Bogdonoff, head, Gas Dynamics Laboratory, Aeronautical Engineering Department, Princeton University.

Dr. Nicholas J. Grant, professor of Metallurgy, Massachusetts Institute of Technology.

Dr. Nicholas J. Hoff, head, Department of Aeronautical Engineering, Stanford University.

Dr. Frank E. Marble, professor of Engineering, Guggenheim Jet Propulsion Center, California Institute of Technology.

Professor Alfred S. Niles, professor, Aeronautical Engineering, Stanford University (retired).

Dr. Alan T. Waterman, jr., associate director, Systems Techniques Laboratory, Stanford University.

In a statement to the Northrop



WELKO GASICH

Norair News on Technical aims and objectives, Mr. Gasich said. "Formation of the Norair Research Council provides the finest intellectual complement to our aerospace programs available anywhere in the world. All members of the Council have long careers in the technologies. They have each made absolutely unmeasurable contributions to the aerospace state-of-the-art and their knowledge helps form the pattern in the course of future advancements, not only for our own generation but for generations to come."

"Norair is indeed fortunate to have their services and guidance."

"We anticipate also that the association will provide in a small and modest way the essentials of a two-way street. Hopefully, these learned men will as the years go by gather some things from Norair that will be

of good scientific substance and usable in their classrooms by the scientific intellects of tomorrow."

Mr. Gasich said that the formation of the Research Council has been under study for many months and is part of (Continued on Page 3)

Dr. Bracha Honored

V. J. Bracha, director of Reliability and Quality Assurance for the Ranger program at Northrop Space Laboratories, has just received congratulatory messages from Lt. General Howell M. Estes, jr., vice-commander, Air Force Systems Command and Major General W. K. Martin, director, Information, Office of the Secretary of the Air Force, for an Author Award from "Aerospace Management" magazine for an article appearing in the August 1962 edition.

Dr. Bracha's article, titled "What's Happening in Reliability Management?" was written while (Continued on Page 3)



DR. V. J. BRACHA



NUMBER ONE BOOSTER — Thomas V. Jones, Northrop chairman of the board and president, receives his "I'm on the Bond Wagon" lapel button from secretary Evelyn Purpus, signifying the official start of the Company's Freedom Savings Bond drive. As aerospace industry chairman of the national Savings Bond campaign, Mr. Jones is Northrop's No. 1 bond booster, leading the way to the Corporate goal of 100 per cent participation.

NORAIR BOND GOAL—100%

Today is "B" day! Likewise Monday, Wednesday, Thursday and Friday!

B for Bonds; B for Buy Bonds; B for Beat the rest of the industry in percentage of participation in the payroll deduction plan! B for the Beginning of the Freedom Savings Bond drive at Northrop.

The campaign week was officially launched on Monday as Northrop's No. 1 bond booster, Chairman of the Board and President Thomas V. Jones, received his lapel button which proclaimed, "I'm on the Bond Wagon."

Mr. Jones is national chairman of the aerospace industry's

portion of the national Freedom Savings Bond drive. Under his leadership the goal for Northrop is 100 per cent employee participation in bonds through payroll deductions.

All personnel are urged to join Mr. Jones in following the official slogan of the Company's drive: "Get on the Bond Wagon."

Dick Nolan, Corporate vice-president and Norair general manager, stated, "I believe that the 1963 Freedom Bond campaign at Norair will establish a Division record in percentage of participation. Reports indicate that many organizations as early (Continued on Page 2)

Ma, Meet the Boss

Periodically, a new batch of supervisors up from the ranks are promoted to assignments of greater Norair responsibility. To these folk we all extend our congratulations and say a hearty "Welcome Aboard."

For many of these gentlemen it marked the big step accomplished from their ambition born on the first day they joined Northrop. Promotions to supervisory status do not come by automatic progression. It is the recognition and reward for conscientious service and marks the moment

By John B. Clark

of greater challenge for all who attain it.

In a Company such as ours, supervisors are more than "bosses" who aim to get the job done. They are more than custodians of production goals—they are, in fact, the custodians of the spirit of Northrop and they, as individuals, represent to their work force the Company itself. Their personnel, whose efforts they direct, look to them for leadership and encouragement.

If I were asked to express in a few words sound advice to a new supervisor, I think I would repeat an expression I heard many years ago—"be the kind of supervisor that your people would like to introduce to their wives and families."

I recall occasion of an earlier "Northrop Family Day" during the war. I heard one of our personnel guiding his wife and kids through the plant, state, "I want my wife and family to see my boss. He sure is one swell guy." A few minutes later I witnessed the family meeting pop's boss. It was a gratifying sight to see and hear the friendly greetings exchanged. I happen to know why this scene was enacted for I have long appreciated that this particular supervisor (he is still with us) is a true leader in every sense of the word. He is a gentleman who goes far beyond the expected accomplishments of his responsibility.

Somehow or other he adds that extra "plus" that marks the difference between an ordinary boss and an exceptional executive. Little wonder that this added plus in human relationship has resulted in this man's production records which are the envy of his associates—and this has been kept up for more than 20 years. Can we not take a lesson from this story and suggest to our new leaders that they try to earn the respect and high regard of all their people by taking more than a passing interest in their personal problems, their families, and their programs for progress. The results could well be that you will be the most important attraction at the next family day now being planned for the near future.

If we were playing a "guessing game" I am sure that many of our oldtimers would recognize immediately, through this story, that particular supervisor to whom the Northrop employee wanted to introduce his wife. If

you don't want to take a guess, call my office and we will be happy to reveal the identity of this outstanding individual. Today I am glad to say he is still in upper management and the good relationship which he established years ago with his people has continued, and, I might say, even increased down through his Northrop years.

Becoming a supervisor puts you right in the "people business" and you can expect only the best from those you supervise if you maintain a genuine personal interest in each member of your work force. It is just as simple as that. A critic of Northrop's human relations policies and philosophies once stated, "Nice guys don't build airplanes." To him I say, "Nonsense, I know hundreds of them." And so do you.

To our newest members of management I hope that you will make the "job satisfaction" of every man and woman working in your group a personal matter. It has been determined that job satisfaction is composed of many things. Surely, one of the most important is the recognition of an individual's dignity and his needs.

Looking at it from a completely selfish point of view, it is well to note that satisfied workers are good workers, and your own success as a supervisor depends mightily on the productiveness of your crew. So, in helping them you are also helping yourself.

A wise man put it this way:

"You can buy a man's time. You can even buy a measured number of skilled muscular motions per hour or day. But you cannot buy enthusiasm — you cannot buy initiative — you cannot buy loyalty — you have to earn those things!"

John Breneman earned them early in his Northrop service. Oops! I have let the secret out. The "swell boss" was, of course, and still is, John Breneman. But, knowing John as we all do, I'm sure you've guessed it before this.

I am convinced that "Northrop is a good place to work because so many good people work at Northrop"—like friend John.

NORTHROP TECH ALUMNI STAGE DINNER DANCE

The second annual dinner dance for alumni of the Northrop Institute of Technology will be held this Saturday, May 11, at the University Club, the News is advised by Paul Ashby, Value Engineering.

All Institute men, and there are many at Norair, are invited.

Social hour in the Crystal Room, 6:30 to 7:30.

The University Club is located at 614 South Hope Street in downtown Los Angeles.

Northrop Norair News

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CHARLES BRADFORD, Editor

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Bond Drive

(Continued from Page 1)

as last week were already over the top with 100 per cent.

"Hundreds of Norair people didn't wait for the official drive week to sign up.

"Our campaign looks very, very good."

To participate in the Savings Bond payroll deduction plan it is necessary only to indicate the amount to be deducted from one's paycheck each week, and then sign the card. A deduction of as little as 50 cents a week entitles an employee to his "I'm on the Bond Wagon" lapel button.

Those people presently enrolled in the plan may increase the amount of their weekly deduction, if they wish, by returning the payroll deduction card with the new amount written in.

Competition has sprung up of its own accord in several ways since the drive was announced last issue. It was reported that personnel of many sections within groups and groups within departments were getting together well in advance of the official opening of the campaign, making plans to "beat" their plant neighbors by being the first to reach 100 per cent participation.

Within the aerospace industry itself, the U.S. Treasury reported this week that Republic Aviation conducted a one-day drive with gratifying results. The Farmingdale, New York firm boosted its 1962 mark of 56 per cent personnel participation to 92.3 per cent.

The leading firm last year, according to the Treasury Department, was Lockheed Aircraft Corporation with 88.7 per cent participation among its employees.

With these figures in view it is

"Operation Roundfile" Aids Division Cost Improvement

"Operation Roundfile," under way since February, is proving to be an outstandingly effective management tool in the Division's cost improvement program.

Byron B. Bonnett, director, Management Research and Services, reports that the drive which started with an around-the-clock series of briefings delivered by Leo Richman, chief, Records Management group, has accounted for over \$100,000 cost improvement in readily identifiable areas of reports and forms alone.

"Operation Roundfile" works best when all organizations make careful search for excess departmental paperwork and eliminate such waste wherever found.

To illustrate cost improvement in "Operation Roundfile," first returns indicate that over 24,000 copies of manually prepared reports have been deleted from

apparent that Northrop's unwavering goal of 100 per cent participation is a must!

This was underscored by Mr. Jones, who said, "I hope everyone in the Corporation will take it as a matter of personal pride to see that Northrop leads the field in this important, patriotic national effort."

The Bond Wagon, carrying Michael Paige's Dixieland band and accompanied by a retinue of Northrop "Bond-O-Girls," was at presstime, scheduled to appear at Norair from 11 a.m. to 1 p.m. tomorrow, Wednesday.

Let's Get on the Bond Wagon.

Division operations. Another 23,000 recipient copies and segments of data processing reports were found unnecessary and subsequently cancelled.

In dealing with Norair departmental forms, 132 were obsolete.

For items other than reports and forms, the following extracts from the first report on Operation Roundfile tell the story:

Returned to Mariposa—41 excess forms.

Records disposed of — 796 linear feet.

Returned to sender by pink slip — The pink slip, Form 1400RM-25, used to return to sender items not needed, not used or not requested. The categories and volume of reported articles were:

- 243 memos.
- 279 copies of reports.
- 123 copies of brochures.
- 72 copies of publications.
- 184 copies of manuals.

To determine inherent cost improvement in Operation Roundfile the Hoover Commission formula is used. This formula states that the cost of paper and printing a form is 5 per cent of the total cost of using the form.

Operation Roundfile uses \$50 as average annual cost of printing a form assuming the form is used repeatedly. However on one shot forms, departmentally issued on a temporary basis, the minimum average annual cost is substantially lower. Operation Roundfile used \$5 annual cost in this category.



SCIENCE TEAM ARRIVES—Northrop Norair's new Research Council scientific team registers for first consultant meeting on Division programs. Greeted by K. E. Van Every, technical assistant to the vice-president, Technical, extreme left, they are from L-R, Dr. Alan T. Waterman, jr., Dr. Nicholas J. Hoff, and Professor Alfred S. Niles, (signing), all from Stanford University; Professor Seymour M. Bogdonoff, Princeton University; and Dr. Nicholas J. Grant, Massachusetts Institute of Technology. Not in photo, Dr. Frank E. Marble, California Institute of Technology. Lobby receptionist is Ann McCormack.

Research Council

(Continued from Page 1)

a long range Division program to upgrade Technical capability throughout.

"The Technical department must be ready and able to fulfill any assignment with which we are charged. The best way to keep ahead in the technologies race is through study, and after that creative application to the products we develop," he said. "One of Norair's prime goals is to have the best scientific and engineering force in the industry. However, the valuable thinking of our Research Council will be of little avail if we lack scope to translate concept into product."

He called to attention a current program in the department whereby men and women are being urged, with Company financial support, to seek higher degrees in their specialties.

It was revealed that many persons in Technical are within a semester of achieving a master's degree. With bachelors the "near miss" potential is also substantial with a number of people within a few subjects of a degree.

"Over the next two years," Mr. Gasich stated, "we hope to see all within reach move to higher plateaus of learning with degrees to prove their proficiency."

It was also pointed out that in addition to upgrading the human capability, the Division is long on the way to provide the most advanced laboratories and other facilities available to a technical team, anywhere in the country. He pointed to the Mach 14 hypersonic wind tunnel just now beginning its runs; the automatic programmed fatigue test complex being built in Plant Three that will put the F-5 fighter through 30,000 hours of simulated operational life; the new 22,400 square foot Research Laboratories, Building 1-180.

Mr. Gasich revealed that equipment for an extensive Division-funded program of research in diffusion welding has been received and is now being installed. This equipment will add to that already being used in Norair's broad research program

in the many phases of exotic space brazement.

New data acquisition equipment is on order—this to make more precise the static test findings for the F-5 fighter and other even higher speed aircraft of the future; new vibration equipment to formalize the Norair system recently perfected for LFC, (see Northrop Norair News, February 15); a universal force feel system to be added to the six-axis flight simulator; more electronics research and test equipment; and an additional \$1½ million test building next year for flight test.

Research and development programs, Company-funded, now under way at the Division include:

Three dimensional real gas boundary layers.

Three dimensional hypersonic flows.

VTOL aircraft stability and control.

Vibroacoustics.

Trajectory optimization.

Hybrid rocket motor studies.

Sharp-lipped VTOL inlet studies.

LFC applications.

Dr. Bracha

(Continued from Page 1)

on active duty with the Ballistic Systems Division and serving as chief of Reliability and Quality Assurance group. The article stated that a reliability revolution is intensifying the challenge to management in both government and industry, that there is a shift in emphasis from product orientation to customer orientation, and that management is now more aware that reliability is a top-level function and must be backed by strong policies.

Dr. Bracha received a degree of Doctor of Philosophy from the University of Southern California's School of Business Administration in June 1962. He was a Command Pilot and held a number of decorations including the Silver Star, the Distinguished Flying Cross, the Air Medal and the Purple Heart.

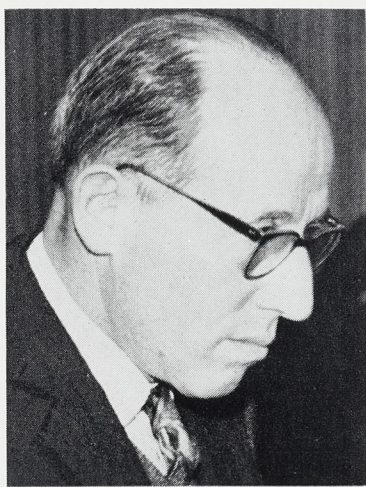
Dr. Bracha was retired from the Air Force in the grade of Lt. Colonel November 30, 1962.

Distinguished Men of Science Mark Norair Research Council

Dr. Nicholas J. Hoff, head, Department of Aeronautical Engineering, Stanford University.

Dr. Hoff whose work is in aircraft and missile structures was educated at Polytech Institute, Zurich, Switzerland, where he received his diploma-engineering in 1928.

He was awarded his doctorate at Stanford in 1942.



Prior to coming to the United States, Dr. Hoff was an airplane designer in Budapest from 1928 to 1938. At Stanford he was a research assistant from 1939 to 1940; and instructor, professor and head, Department of Aeronautical Engineering for Applied Mechanics, Polytechnic Institute of Brooklyn from 1940 to 1957. He has been at Stanford for the past five years.

Dr. Hoff is author of "Analysis Structures" published in 1956. In addition he has written over 100 technical papers and edited at least three scientific books.

Professor Seymour M. Bogdonoff, head, Gas Dynamics Laboratory, Aeronautical Engineering Department, Princeton University.

Professor Bogdonoff has been a scholar and faculty member at Princeton University since 1946.

A specialist in gas dynamics,



he developed the University's high speed research facilities and became director of the gas dynamics laboratory in 1953.

He has been professor of aeronautical engineering at Princeton since 1956. During the years 1942 to 1946 he was with NACA at Langley Field, Virginia as assistant section head, Fluid and Gas Dynamics Analysis section in charge of compressor and turbine research.

Professor Bogdonoff received his bachelor of science at Rensselaer Polytechnic Institute in

1942 and his master of science from Princeton in 1943.

He is a fellow of the IAS. He has served as consultant to industry and government since 1950.

He is the author of many technical papers, particularly on hypersonic aerodynamics and facilities.

Dr. Alan T. Waterman, jr., associate director, Systems Techniques Laboratory, Stanford University.

Dr. Waterman's special fields are those of radio-wave propagation and electronic countermeasures. He received his bachelor of



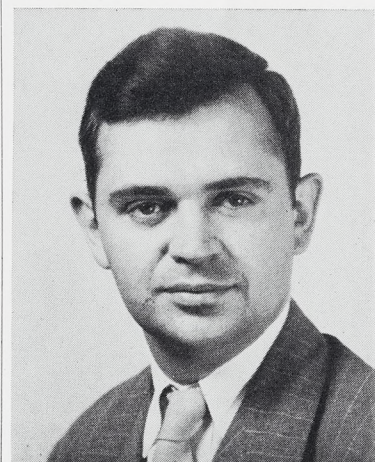
arts from Princeton University in 1939, his bachelor of science in 1940 from California Institute of Technology, his master of arts in 1949 from Harvard University and his Ph.D. in 1952 also from Harvard University.

Dr. Waterman has served the aerospace technologies as a member of the faculty at the University of Minnesota, 1941 to 1942; California Institute of Technology, 1942 to 1945; Columbia University during 1945; and at University of Texas from 1945 to 1946.

He has been at Stanford since 1952.

Dr. Frank E. Marble, professor, Division of Engineering, Guggenheim Jet Propulsion Center, California Institute of Technology.

Dr. Marble's special field is that of propulsion—fluid mechanics, gas dynamics, and magneto-hydrodynamics. He received his



bachelor of science in 1940 and master of science in 1942 from Case Institute of Technology. At California Institute of Technology he received an aeronautical engineering degree in 1947 and his Ph.D. in aero-math in 1948.

Dr. Marble has served with NACA as project engineer, Flight Propulsion Lab, and as head of the analysis section, and chief, Fundamental Compressor and

Turbine Research.

Dr. Marble, following his doctorate, became aeronautics instructor at Cal Tech in 1943. Subsequently he was associate professor of jet propulsion and mechanical engineering. In 1957 he was made full professor.

Professor Alfred S. Niles (retired), professor of Aeronautical Engineering, Stanford University.

Professor Niles' special field is that of aeronautical engineering.

He was educated at Johns Hopkins University where he received his bachelor of arts in 1915, and at the Massachusetts Institute of Technology where he was awarded his bachelor of science degree in 1917.

He served as assistant civil engineer at MIT from 1917 to 1918 and as aeronautical structures



engineer at McCook Field, 1920 to 1927.

He was professor of aeronautical engineering, Stanford University for the last 35 years, 1927 to 1962 the time of his retirement.

Dr. Nicholas J. Grant, professor of Metallurgy, Massachusetts Institute of Technology.

Dr. Grant was educated at Carnegie Institute of Technology, attaining his bachelor of science in 1938, and at Massachusetts Institute of Technology where he received his doctor of science in 1944. He has been a member of the MIT faculty continuously since 1942.

Dr. Grant is president of N.E. Materials Laboratory; technical director, Investment Castings Institute; and chairman of Tang Industries. He has served as consultant to industry since 1947.

He holds membership in the



American Society of Metals and the American Institute of Mining, Metallurgy and Petroleum Engineers. Dr. Grant has published numerous articles on the technological sciences during his career.



RIDES WANTED

7 a.m. — 3:45 p.m.

228TH & AVALON OR MAIN, Wilmington. Zelma Daily, ext. 1570. 2

186TH & TOWNE AVE., Gardena. Genaro Chapa, ext. 2568, DA 3-9447. 2

VAN NESS & FRANKLIN, Hollywood. Tom Kovich, ext. 2568, HO 2-4557. 2

7:30 a.m. — 4:15 p.m.

WARNER & BEACH BLVD., Huntington Beach. A. L. Nolder, ext. 4246, 2207, 847-6286. 3

8 a.m. — 4:45 p.m.

LENNOX & FREEMAN, Lennox. Ann Gaines, ext. 2455, 671-8719. 5

STOCKER & CRENSHAW OR LA BREA & COLISEUM, Los Angeles. Arthur Fein, ext. 1241, AX 5-5833. 2

BBSF Classified Ads

BBSF classified ad service is provided free of charge to all Northrop Norair personnel.

Ads for agencies, commercial enterprises and private businesses are not accepted.

Deadline is noon Wednesday, one week before publication.

FOR SALE

PLYMOUTH, 1956 Savoy sedan, good transportation, \$225 or best offer. DA 9-7333 eveninas. A

VALIANT, 1960 V200, auto. trans., p/steering, 31,000 miles, \$1050, 831-9707. A

BEDROOM SUITE, silver fox finish, bookcase headboard, 2 night stands, lae. Mr. & Mrs. chest, dressing table w/ bench, lae, mirror, \$75; dinette set, yellow, \$20. FR 7-1094. A

PIANO, Kinabury upright, light oak finish, recently tuned, \$100. OS 6-5529. A

TRUMPET, Grand Rapids, w/case, \$40; oven, Kenmore port. elec., \$15. GL 6-2559. A

MODEL RAILROAD PARTS. Varney & Mantua, O & HO aaaa in Varney Display case, \$10; desk light, fluorescent, \$2; magazine, Model Railroader, 48 issues, 35¢ a copy or \$15 for all; typewriter, Remington port., \$15 GE 1 4223

FALCON, 1960, std. shift, r/h, \$935, 379-1263. A

RUNABOUT, 16' glass Fleetcraft, w/40 hp motor, elec. starter, generator, Morris controls, 15" wheel trailer, \$795; range, gas, & refrigerator, apt-size, \$25 ea. DA 4-7824. A

JAGUAR, 1951 4-dr., r/h, \$595; air compressor, new motor & spray gun. \$50. OS 5-3100. A

VOLKSWAGEN, 1955 deluxe sedan, \$700; muffler, 1961 Ghia, \$5; large swing-alider set, \$10; tumbletub, \$2. FR 5-8804. A

FORD, station wagon, 1956, 9-pass., \$300, 679-8426. A

OLDSMOBILE, super 88, 1955 4-dr. sedan, r/h, good tires, p/steering & brakes, \$295. DA 3-0940 after 4:30 p.m. A

VACUUM CLEANER, w/polisher & Magic Disk, \$100. DA 6-4050. A

WHEEL COVERS, 4 14" for 1957-58 Chevrolet, \$10; trailer hitch for 1957 Chevrolet, \$5; bowling ball, 12" Ace, black w/blue, \$12.50 or best offer; deluxe meat slicer, \$10 or best offer; card shuffler, \$2. FA 8-4267. A

OLDSMOBILE 88, 1954 2-dr., r/h, w/w, \$295. OS 6-3110. A

SOFA BED & chair, aray & gold, 2 end tables & coffee table, \$30. OS 5-9205 after 5 p.m. A

PLYMOUTH, V-8, 1957, r/h, w/w, rebuilt engine. \$595. DA 9-2181. A

BINOCULARS, 7x35, Skyline Precision View, w/case, \$25, 671-4250 after 4 p.m. A

PICKUP CAMPER, 9' long, alum., fully insulated, \$475; 1 1/2-ton truck, 1923 Model T, \$450; MG-TD, 1951, new paint, \$475, 867-1476. A

FORD PICKUP, 1950, w/1955 Mercury ena., 6-ply tires, \$350, 323-1774. A

FURNACE, Minneapolis Honeywell, wall thermostat, \$11; Hobbs engine hour meter, Model M1, 24 volts, for aircraft marine or other enas., \$15. ST 8-9709

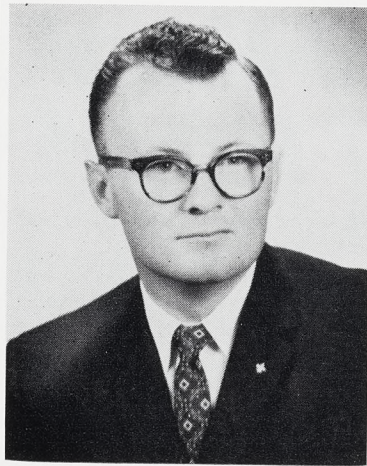
LINCOLN CAPRI, 1953, full power, \$250 or best offer. DA 4-4467. A

OVEN, Westinghouse elec., w/cabinet & auto. timer, \$50. UN 5-5084. A

BICYCLE, 10 - spd., Derailleur - Raleigh blue, \$65. OR 1-1660. A

GO KART 1200, Mac 7 ena., deluxe seat, \$250; mini-bike, Bua Trail Scout, Briaas & Stratton ena., \$170. UN 4-7673. A

POWER MOWER, reel-type, \$35. DA 3-6152. A



P-A MAN—Richard B. Pryor has been appointed general supervisor in charge of Norair's Personnel Activities branch, effective May 6. Mr. Pryor comes to Norair from Western Airlines where he held a similar position.

FOR SALE

CORVETTE, 1958, 3-spd., h/top, \$2095; Plymouth, 1932 rdstr., new ena., \$250. FR 8-1674. A

FORD, 1956 h/top, T-Bird ena., 1-owner, 49,000 mi., w/w., new brakes & recaps, \$650. FR 8-2761. A

CAMPING TRAILER, 2-wheeled, \$60; super charger, McCullen, \$20 or make offer. OS 5-2159. A

FORD, 1933, 5-window coupe, orig. & complete, 4-cyl. ena., \$425; Ford, conv., 1940, body completely reworked, \$250. DA 3-4640. A

FREEZER, med. size, chest-type, \$80. FR 7-3487. A

VOLKSWAGEN, pickup, 1959, r/h, \$795. DA 6-6214. A

BUICK, Super, 1957 2-dr, h/top, \$515. CL 6-0167. A

HOUSE, 3-bdrm., 1 1/2 baths, modern, 6-yrs-old, will assume 2nd T.D., \$26,500. TE 3-3036. A

SKI BOAT w/trailer, skis, 25 hp Sea King, unsinkable fiberglass, \$395, 671-8719. A

GUITAR, Gibson, jumbo, concert-type, non-electric, accoustical, \$110. OR 1-3455. A

SKI BOAT, 13'6" Champion Saber, 1960, 1958 rebuilt 35 hp Evinrude, trailer, 1960 Wall factory, 4 life jackets, set of water skis, \$500. OS 6-8253. A

CRIB, Babyline & firm mattress, blonde, \$10; bassinet w/hood & stand, ivory, \$5; baby scales w/weights, Health-o-meter, \$5. DA 9-4660. A

CAMERAS, Rolleiflex f.3.5 w/built-in lite meter & case, \$150; Crown Graphic, 4x5 w/case, \$135; enlarger, Beseler 45M, \$150; misc. dark room equip. WE 5-0493. A

SHOTGUN, 12 ga. Hiaqins, pump-type, variable choke, \$65, 371-9673. A

FORD, 1958, 4-dr. wagon, 352 ena., 4 barrel carb., power brakes & steering, r/h, \$800, 676-6762. A

FORD, 1958, 4-dr, h/top, r/h, automatic, \$700, 676-3828 after 6 p.m. A

TWIN BEDS, 2, maple spindle, \$7.50 ea.; youth beds, 2, \$5 ea.; gas dryer, Kenmore, \$25. DA 3-5381. A

TELEVISION, 24". Silvertone, maple, \$75. DA 3-6074. A

GERMAN SHEPHERD, pure bred, males, \$35; females, \$25; solid blk. male, \$50; crib & mattress, \$25; playpen, Cosco, \$10. NO 4-4083. A

VOLKSWAGEN, 1960 sedan, Becker radio, seat belts, \$1130, 378-7251 after 5 p.m. or weekends. A

RAZOR, Remington Electronic, \$10; automobile cooler, window-type, \$3.50; oscillating sanding attach. for drill motor, \$4.50. FR 5-5760. A

BOAT, 16', glassed inboard w/trailer, 1941 V-8 ena, w/dual manifold, lots of extras, \$775. FA 8-4188 after 5 p.m. or weekends. A

PLYMOUTH, 1956 4-dr. sedan, V-8, automatic, radio & p/steering, \$400, 376-3849. A

PIANO, \$150; chair & ottoman \$50; rugs, braided, \$75 & \$35. DA 5-1648 eveninas. A

HOUSE, Del Amo area, 3-yrs-old, 3-bdrm., 2 baths, lae, family rm., carpeting, drapes, block wall, \$26,500, 326-5874. A

WANTED TO BUY

STROLLER, w/fully castored front wheels fold-up type preferred. TO 9-3505. B

FREE (to be given away)

KITTENS, calicos, tabbys & tigers, will be ready approx. June 1. DA 7-9934. D

PICKUP TRUCK BOX & fenders. Ideal for trailer. FR 4-2915. D

RENTALS OFFERED

HOUSE, 1-bdrm., furn., utilities pd., in rear, adults, no pets, near Northrop, \$120 mo. OS 5-7937. E

NRC Announces 15th Annual Art Show

Northrop Recreation Club, President Fred Armstrong, has announced that the 15th Annual Art Awards Exhibit has been scheduled for June 5 through June 19 with paintings to be displayed in the Plant One cafeteria.

Deadline for entries is May 31.

Art Club Commissioner John Kayser states there will be three classifications this year; oil, water color, and dry mediums. And there will be no distinction made this year between paintings submitted by amateur and professional.

The awards will be trophies and will be given for first, second and third place in each of the classifications.

A jury of three professional artists will do the judging.

Northrop personnel will also have an inning in that there will be a popular vote conducted for sweepstakes. Sweepstakes balloting will be held June 11 at the Plant One cafeteria.

Complete rules and entry blanks are available at Personnel Activities and at Mariposa.

Some rule highlights:

Each artist is limited to three paintings.

Pictures have to be original not copies of other paintings or photographs.

Pictures entered in previous art shows are not eligible.

All entries must be framed and equipped with picture wire ready for hanging.

All entries including the winners will remain the property of the entrants.

MAY 22, DATE FOR NEXT VISIT OF BLOODMOBILE

The next visit of the Norair bloodmobile will take place Wednesday, May 22.

Quota for this stand is 300 donors. Donor applications are on file with all organizations. Department clerks will arrange an appointment for those who intend to participate.

The bloodmobile will be stationed at the Product Display Building from 7:30 a.m. through the day and night shifts to 12:30 p.m.

RENTALS OFFERED

APT., lae, bachelor, furn., utilities pd., Gardena area, \$65 mo. DA 4-5774. E

APTS., sparkling new, carpeting, drapes, built-in range & oven, disposal, sliding glass door to private patio, pool, in foothills of Rolling Hills near Crenshaw & 101, adults, 2-bdrm., \$125 mo., 1-bdrm., \$100 mo. 326-0474. E

APT., unfurn., 20 min. from Northrop, 2-bdrm., large closets, tile kitchen, re-decorated, lighted off-street parking. GA 4-0590. E

HOUSE, s/w Torrance, 3-bdrm., w/w carpeting, large fenced backyard, dbles, car garage, children & pets OK, \$150 mo. 347-7844. E

DUPLEX, 2-bdrm., unfurn., adults only, no pets, \$115 mo. OS 6-1985. E

APT., unfurn., upper, 1-bdrm., stove, refrigerator, private patio, w/bar-b-q, \$125 mo. on lease plus utilities. 372-3878. E

APT., 1-bdrm., unfurn., aaaaa, 2 miles from Norair, adults, \$80 mo. OR 4-0755. E

HOUSE, 2-bdrm., near Northrop, disposal, laundry room, water & trash paid \$110 mo. OS 5-9695. E

APT., 2-bdrm., w/w carpets, built-ins, drapes, aaaaa, upper, no pets, children OK, \$100 mo. OS 6-2501. E

APT., 2-bdrm., lower, unfurn., 900 sq. ft. w/built-ins, w/w carpeting & drapes, carport, walking distance to Northrop & shopping, \$115 mo. 772-1992. T

HOUSE, 2-bdrm., fenced yard, children OK, aaaaa disposal, OS 5-7409. E



PROUD FATHER—Paul White, NRC treasurer and former scoutmaster, NRC Boy Scout Troop 262, at left, looks on while his son, Ralph, receives congratulations from Bill Wareing, NRC Scout commissioner, for attaining the coveted eagle rank. At right, Fred Armstrong, NRC Club president, adds his well done. Young Ralph is the first eagle scout to matriculate through the Club troop. He will soon be joined, however, by several other high-ranking members who are near the big goal.

Tennis Club Completes Five-week Tourney Play

The 4th annual NRC Tennis Club tournament after five weeks of spirited play at El Camino and Compton Junior College courts has now drawn to a close, it has been announced by John Potts, commissioner.

Under the leadership of tournament chairman Chuck Wood, the play drew a record number of racket and net folk to the four-level contest series.

Novice men's singles played at El Camino was won by Ken Woelfel, 6-3, 6-3 over Sol Condiotte.

Class C, men's singles played at Compton J.C. went to Al Tennant, 2-6, 6-2, 6-2 over Russ Gallagher. Seeded players were George Kall and winner Tennant.

D men's singles, Compton J.C. was won by Kurt Pfizenmaier, 6-3, 6-2 over Joe Kline. Seeded players were winner Pfizenmaier.

SUMMER DATES SET FOR DEEP SEA CHARTERS

All aboard.

The NRC ocean fishing boat charter schedule for the spring and summer has been announced.

The boat is the new 53-foot Maverick. Skipper Russ Izor, 24 bunks—which materially eases the early departure-long trip strain.

Cast off time for all charters is set at 1:45 a.m. on Saturdays. However, fishermen should verify this with Personnel Activities, one day prior each time out.

The dates are May 25, June 22, July 27, August 24, and September 28. Also if there is a demand, a trip will be made October 26.

Prize each trip will be a tackle box, courtesy NRC.

Reservations, first-come, first-served, are made at Personnel Activities.

Also of fishing interest is the 1963 NRC Fishing Awards Program; ask Personnel Activities for sheet of qualification rules.

PERSONALS

U.S.S. Lexington, CV-2 Minutemen Club will hold its 10th annual reunion, June 27-30. Men who served aboard this aircraft carrier can obtain further information by calling OS 5-0563 after 4 p.m. L

GOING to Ala., 1 or 2 riders wanted. Leaving May 20 or 21. 327-7287. L

Kline, Ed Horgan and Dick Finke.

Open women's singles played at El Camino was won by Susan Burris, 6-4, 6-0 besting Pat Wardlow. Seeded players were Susan, the winner; Mel Likens, Pat, and Nancy Finke.

Open mixed doubles played at both El Camino and Compton was won by Helen and George Kall, 6-4, 6-1 over Maxine Lewis and Chuck Wood.

Open men's doubles went to the team of Dan Manning and Kermit Oswalt, 6-4, 2-6, 6-1 beating out Dick Bartholomew and George Brundage.

TRAVEL CLUB MEETS TO TALK ABOUT MEXICO

Holiday in Mexico—!

The NRC Travel Club, Howard Cornelius, commissioner, will discuss details of the holiday in Mexico trip at the next meeting, May 16, 7:30 p.m. at the Parish House, 122nd and Prairie, Hawthorne.

Cost for Holiday in Mexico as with Holiday in Hawaii, both trips scheduled for the same date, is \$398.

Firm arrangements have now been made for the Travel Club's Las Vegas Daze scheduled for June 21 through June 23.

Club members will leave Friday night for a round trip on Bonanza Airlines, spend two nights at the Sahara Hotel, have dinner, see the show plus cocktails and swimming, all for \$60 each.

"Reservations are limited for this one," says Howard. "It will be first-come, first-served. A deposit of \$20 will tie down your trip."

!ZOOM----ZAM!

Third Annual ROARING '20's BALL

June 22, 1963

MAYFLOWER BALLROOM

Tickets at P-A, Limit 600



Northrop Norair News

Issued biweekly by Norair Division of Northrop Corporation • Wednesday, May 22, 1963

HAWTHORNE, EDWARDS AFB, PALMDALE

SAN ANTONIO, EL PASO

Three Hundred T-38s for the Air Training Command



Northrop X-21 Achieves Laminar Flow Control

The U. S. Air Force Northrop X-21 has established a new aeronautical milestone by achieving Laminar Flow Control over its wing surfaces with a measurable reduction in drag.

The aerodynamic phenomenon was achieved over sections of the wings during flight test at Edwards Air Force Base last week. This is the first time that Laminar Flow Control has been achieved on an airplane wing that approximates the size of those of jet transports.

Jack Wells, chief engineering test pilot for Norair Division, who was flying the X-21, said he could actually feel a reduction in

drag as a result of laminar flow. He said he had to reduce engine power so as not to exceed the stabilized test speed when the flight test engineers, Roy Whites and Bob Thomas, turned on the Laminar Flow Control system. Laminar flow data obtained from precise instrumentation in the research airplane are being analyzed.

Laminar flow is achieved by inhaling a very thin layer of air through razor-thin slots in the wing surfaces. Suction compressors mounted in pods beneath the wings pull the air through inner-wing ducts and expel it to the

(Continued on Page 3)

THIRD MILESTONE—Northrop Norair rolled out the 300th T-38 supersonic trainer for shipment to Palmdale final flight, and flyaway by the Air Force. To mark the occasion Norair Manufacturing folk gathered at flight door for photo and Godspeed. From left, front row are Al Dye, driver; Victor Leikan, foreman; Kenneth Craig; Benny Frazier, foreman; Connie Rivas; Al Carr, superintendent, T-38 and F-5 Assembly Operations; Ole Omley, director, Production Operations; Karl Kiland, Walt Ickes, Roland Hilliard, foremen; Percy Parker; Slim Langland, foreman; Otis McCoy; Lucien Wood, jr.; Tony Mauna; Warren Treharne, foreman. In rear, from left, Gerald Browne, foreman; Ed Bueltel, coordinator; and Gene Vossen.

RECORDS SMASHED IN FREEDOM BOND DRIVE

A record-smashing total of 98.5% employee participation in the U.S. Savings Bond payroll deduction plan was achieved at Northrop last week as personnel throughout the corporation responded vigorously to the com-

pany's 1963 bond drive.

Personnel at Norair did their part by attaining a participation of 99% by the end of the drive on May 11. A partial corporate breakdown of percentages of employee participation by departments, divisions and subsidiaries includes the following figures:

Northrop Architectural Systems, 100%; Northrop International, 100%; Corporate office, 100%; Northrop Norair, 99%; Northrop Nortronics, 98.3% (Precision Products, 100%; Marine Equipment, 99.5%; Systems Support, 98.1%; Electronic Systems and Equipment, 97.6%); Northrop Ventura, 96%; Northrop Space Laboratories, 93%.

The figure for Northrop Page Communications is not included. Due to a later start in the company's bond drive, the Washington, D.C. subsidiary is extending its own campaign one week and will add its participation figure to the corporate total at that time.

In complimenting Norair personnel for achieving 99% payroll deduction participation in the bond campaign, Corporate Vice-president and Division General Manager Dick Nolan stated, "It is deeply gratifying to see Norair people go all out in sup-

port of the Nation's Freedom Bond program. This is teamwork and loyalty at its finest.

"We are also very proud to announce that our showing ranks among the highest in the Corporation.

"Well done, and congratulations to all."

President and Chairman of the board Thomas V. Jones extended his thanks to every employee who helped the company reach

MEMORIAL DAY

A holiday coming up!

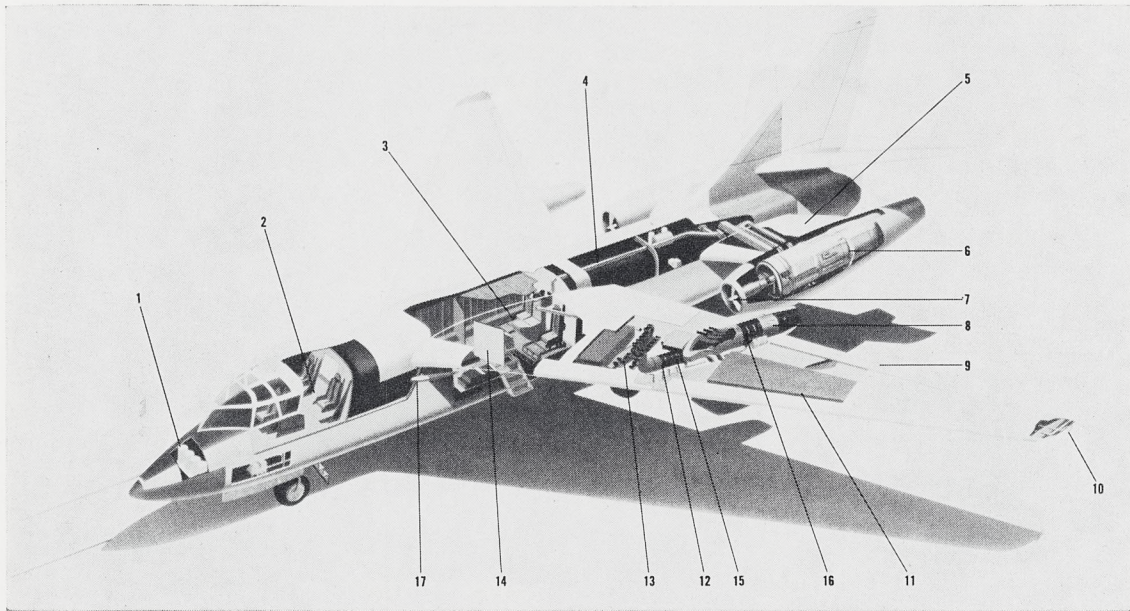
All Norair Division facilities will be closed Thursday, May 30, in observance of Memorial Day, a Norair paid holiday.

The day following, Friday, is a regular workday.

its record-setting mark by signing up for bonds either before or during the campaign.

"Our attainment of 98.5% makes Northrop to date the number one aerospace company in the nation in bond participation this year, which is as it should be," Mr. Jones said. "This record reflects the spirit of cooperation and public service we can always count on from Northrop people."

"I wish to give an extra vote (Continued on Page 2)



INSIDE THE X-21—Artist's cutaway port view of the Northrop X-21A Laminar Flow Control aircraft, calls out the following major components. (1) Stores; (2) crew compartment; (3) flight test engineers compartment; (4) bleed air line; (5) left-hand engine pylon; (6) left-hand YJ79-GE-13 engine; (7) engine variable inlet plug; (8) high pressure compressor; (9) aileron; (10) fuel tank vent; (11) outboard fuel tank; (12) low pressure collector duct; (13) LFC system modulating valves; (14) flight test instrumentation panel; (15) low pressure compressor; (16) low and high pressure mixing chamber; and (17) fuselage side fairing.

Air Force Visitors --- Spring Management Symposium



Serv-Ur-Self

In a communication from Bill Williams, Organization 1243, Education and Training, he cites as his selection for "Northrop's Greatest Fringe Benefit" the operations of his own group, Education and Training.

Bill, in developing his thesis, outlines the many advantages and opportunities offered North-

By John B. Clark

rop Norair folk who refuse to stop growing and are now enhancing their capabilities by increased learning from the varied programs available through the Training and Education group.

I think you will find Bill's outline informative and perhaps, I hope, challenging. Bill puts it this way:

"Self Service! Do-it-yourself! You truly live in an era where you select what you want or need and then you do it yourself. We are in an environment of self-service stores, gas stations, and many other serv-ur-self businesses as well as do-it-yourself kits for everything ranging from pocket-sized radios to full-sized homes. These practices can, without much imagination, be related to your wants and needs in the area of education. People of all ages are attending day and night



classes within companies and schools in a vast self-service and do-it-yourself project.

"Norair is most interested in the general and specialized upgrading of all personnel in their particular assignments. It is recognized that a substantial portion of this upgrading will result from experience on the job. Beyond the normal progress expected from doing your job, it is possible that you can accelerate the upgrading of your capabilities through selective formal education.

"The Division provides opportunities for you to do this. The

decision to take advantage of these opportunities is entirely yours—as it should be. You and you alone are the only one who can come to the conclusion that additional formal education is important to you. Without question, you are your best critic for evaluating yourself in terms of your own background, experience, knowledge, ability, potential, family situation.

"What are some of these self-service and do-it-yourself educational offerings available for your selection?

In-Plant After Hours Courses

"Subjects such as 'Work Simplification,' 'Basic Electricity,' and 'Transistors' are presented in classes conducted by qualified Norair instructors. These courses are intended for persons who can profit from specialized instruction in specific areas of work. The courses are given periodically and are announced throughout the plant by means of the bulletin board service.

Junior College Classes

Arrangements have been made with El Camino, Harbor, and Trade Technical Colleges for Norair to pick up the tab for expenses for employees who attend approved courses at these institutions. The courses run the gamut from professional to technical types, including those which are required for degree purposes. If the course is considered as being worthwhile to Division operations by your supervisor, it can be approved by Education and Training. Certain courses are preapproved prior to each semester. Such classes are 'Written Communications', 'Elements of Supervision', 'Human Relations', and 'Organization and Management'. Announcements are made prior to the start of each semester.

Master's Degree Program

"Norair has arranged with the University of Southern California to provide, on Company premises, about one-half of the courses required for a master's degree in Engineering. The balance must be taken on campus. To enter this program, one must possess an acceptable bachelor's degree in Engineering and be admitted as a graduate student at the University of Southern California. University professors conduct all classes and Norair finances the courses held at Norair. Attendance at USC may be reimbursed under the Educational Refund Plan.

Educational Refund Plan

"This program enjoys great popularity with Norair employ-

AIR UNIVERSITY, USAF—Over 70 visitors from the Air Force Institute of Technology visited Northrop Norair as part of the 1963 Spring Management Symposium. Leading the team (in uniform, center) were from left, Lt. Colonel A. L. Savoca, chief, EWI Programs; Colonel K. D. Stevens, deputy commandant; Colonel M. R. Palmer, director, Civilian Institutions Programs; and Major T. E. Hopper, who will succeed Colonel Savoca in June. Photo was taken at Norair's Science Center.

Bond Drive

(Continued from Page 1)

of thanks to all those who took part in the operation of the drive, from the organizational levels to the individual promotion work of the mail couriers. Their efforts were responsible in no small part for the success of the campaign."

Mr. Jones pointed out that the present percentage figure will probably increase even further during the next several weeks. This is expected to occur as those people on leave or away from their home office for some reason during the week of the drive return and sign up in the bond plan.

The final figure as of July 4 is the one that will go on record nationally for the company. On that day Mr. Jones, who is chairman of the aerospace industry portion of the 1963 national Savings Bond campaign, will report with other industry chairmen to Secretary of the Treasury Douglas Dillon in Washington, D.C. on the results of all the company drives in his area.

ees. It enables you to select the course and institution of your choice. You have the expectation of reimbursement upon successfully completing the course, providing it has been determined to be of value to the Company for you to attend. Detailed coverage and the required procedures are described in Standard Practice Procedure 2-7.4.

"The educational offerings cited represent those available for your selection as you see the need. Should you desire assistance in determining whether additional formal education is a good bet in your case, and the types best suited for you, you are invited to take advantage of the Education and Training counseling service. Offices are located in Plant one, Extension 2437, and the Engineering Science Center, Extension 1893."

Well stated Bill Williams! Now, anyone for higher learning? Step up and take some! Bob Rolfe, chief, Education and Training, and his people might be considered as your personal "fringe benefit," proving that your Company wants to help you attain your academic objectives. Don't push, folks. It's never crowded at the top and good luck to you all!



WELCOME — Northrop Corporation welcome was extended by Dr. Wm. F. Ballhaus, Corporate executive vice-president. A-F men spent a week in California to observe modern aerospace managements in action. In addition to Northrop—Hughes, SSD, Philco, and Lockheed were visited.



MR. NOLAN — Dick Nolan, Corporate vice-president and Norair general manager, spoke on Company philosophy and management techniques and approach. Air University has now sent study teams to Northrop Norair for three consecutive years. Visitors come from stations all over the United States.



V/STOL — Standing, Colonel Palmer, Tom McCarthy, and George Grogan, P.1127 project director, talk about the Northrop-Hawker Siddeley Aviation Limited joint program on the P.1127.



LEADERS — Management symposium leaders shown here during coffee break, Major Hopper, Colonel Stevens, and Colonel Palmer. Norair management briefings and product presentations were arranged and coordinated by Tom McCarthy, manager, Norair Administration.



LFC — Don Warner, manager, LFC, discussed Norair management on Laminar Flow Control project. EWI men at Northrop during current 10-month tour are Major James Brower and Captain Roger Whitacre. Company EWI coordination is under jurisdiction of Harry Blocher, supervisor, Training and Equipment.



MANUFACTURING — Lt. Colonel Savoca, Jack Mannion, manager, Norair Manufacturing, and Dr. Ballhaus, review significant points of Division production programs on the T-38.

Northrop Norair News

VOL. 21

NO. 9

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A NORTHROP CORPORATION
PUBLICATION
NORAIR DIVISION
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CHARLES BRADFORD, Editor

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Laminar Flow Control

(Continued from Page 1)
 rear. This prevents the build-up of high-drag turbulence and decreases the friction drag on the wing surfaces to essentially zero. The net result of this drag elimination will be great increases in range, payload capability and long flight endurance.

The X-21 program is being conducted under contract with the Aeronautical Systems Division of the USAF Systems Command.

A second X-21, now nearing completion at Hawthorne is scheduled to join the testing program in July.

Dozens of flights will be made by the X-21's from Edwards Air Force Base in which the airplanes, with their laminar flow systems functioning, will be subjected to typical operating conditions.

As the test program progresses, laminar flow will be recorded over an increasingly high percentage of the wing surfaces at altitudes between 24,000 and 40,000 feet.

Further flight tests will provide data for comparison of laminar versus non-laminar flight and the resultant increased performance factors provided by LFC.

Other tests will explore the effects on the laminar flow system of adverse operating conditions. For instance, flights will be made to determine how the laminar flow system performs in rain, sleet, and snow. To determine what happens under severe icing conditions, an X-21 will be flown into a "cloudburst" released by a water-filled tanker airplane flying ahead of it. Other tests will determine the effects of maneuvers, turbulent air, humidity, clouds and the impingement of dust, dirt, or insects.

By undergoing these tests, the X-21's are expected to demonstrate the practicality of LFC operation and maintenance and will produce the data necessary to apply this most significant aerodynamic improvement to current and future aircraft designs.



AT NSL—With giant lunar photograph looking on, Dr. Ludwig Roth, vice-president and manager, Research department, presents 15-year service pin to Northrop Space Laboratories man Glenn H. Williams, acting head, Behavioral Sciences. Other scientists offering congratulations seated from left are Dr. Martin J. Gould, head, Electromagnetics Laboratory; Dr. James G. Gaume, director, Life Sciences section; (Dr. Roth and Mr. Williams); Dr. Samuel H. Levine, head, Nuclear Sciences Laboratory; Dr. Robert G. Lindberg, head, Bioastronautics Laboratory. Standing, from left, Dr. Fred C. Thiede, Biodynamics Laboratory; Robert D. Thomas, chief health physicist; Robert R. Berlot, head, Planetary Physics and Chemistry Laboratory; and Dr. Robert D. Johnson, head, Space Materials Laboratory.



COMMENTING ON THE T-38—"Excellent device. The orientation ride, a very great pleasure. Makes it worthwhile coming to America," so said P.1127 Hawker Aircraft Ltd. test pilot Hugh Merewether after his hop in the Northrop trainer. Mr. Merewether's P.1127 briefings and color film were very popular. He gave two talks at Norair before management, science and technical people; more at Edwards before Air Force Flight Test Center officials. He is here center, with Lew Nelson, director, Test and Jack Wells, chief engineering test pilot.

"On the Bond Wagon" Pictorial



RECORD-SMASHING TOTAL—Northrop Corporation, with Norair Division within one per cent of the magical goal of 100 per cent, came through with a record-smashing participation performance in the Freedom Bond Drive. The campaign was exciting all the way. Photo shows Company Bond-O-Girls doing the twist during lunch hour performance. From left, Mike Paige, Dixieland band man, tootling the sax for Helen Townsend, Nortronics and Norair's Linda Travis, Mae Moore, Betty Linton, Nancy Post.



THEY PLANNED IT ALL—Norair's Freedom Bond Drive working committee, from left, Lee Ohlinger, director, Information Processing Center; George Forbes, paymaster; Marie Tully, assistant welfare coordinator; Paul Crews, assistant director and John Clark, director, Industrial Relations and Security; Clay Fullenwider and Rip Godfrey, Master Programs and Analysis; and Don Kohler, Personnel Activities. Pipe those hats.



PLEASING REPORT—Participation reports were issued each day during drive. This one being reviewed by Management Council was for Monday, the first day and shows how Norair got jump on percentages. From left, Bob Catlin, manager, Quality Control; Tom McCarthy, manager, Administration; Milt Kuska, deputy assistant general manager, Technical; Grant Macdonnell, treasurer; Dick Nolan, Corporate vice-president and Norair general manager; R. M. McNamara, manager, Contracts and Pricing; and Bob Lloyd, vice-president and assistant general manager, Operations. Not in photo, Welko Gasich, vice-president and assistant general manager, Technical; Jack Manion, manager, Manufacturing; and Frank Forve, Division counsel.



SIGNUP TOUR—Pretty Linda Travis talks bond economics with Earl Mercer during Bond Wagon show at new assembly building. Drive was on for five days, starting May 6, ending May 11. Many organizations turned in 100%.



TREASURY OFFICIAL—Bob Lloyd and Clem Eller, state director, U.S. Savings Bond Division, compliment Bond-O-Girls and the Dixieland band for fine job they were doing in bringing the Freedom Bond campaign to the attention of plant public.



RIDES WANTED

7 a.m. — 3:45 p.m.

83RD & BUDLONG, Los Angeles. W. L. Nichols, ext. 2170, 758-5383.

7:30 a.m. — 4:15 p.m.

WESTERN AVE. & CENTURY BLVD. Los Angeles. Edna Ely, ext. 2151, PL 5-8369.

PARKER ST. & PASEO DEL MAR, San Pedro. William Lurie, ext. 2041, TE 3-2512.

8 a.m. — 4:45 p.m.

LENNOX & PRAIRIE OR HAWTHORNE, Lennox. Ann L. Gaines, ext. 2455, 671-8719.

REDONDO BEACH & NORMANDIE, Gardena. Bernice Oddy, ext. 2151.

RIDES OFFERED

7:30 a.m. — 4:15 p.m.

PARKER ST. & PASEO DEL MAR, San Pedro. William Lurie, ext. 2041, TE 3-2512.

BBSF Classified Ads

BBSF classified ad service is provided free of charge to all Northrop Norair personnel.

Ads for agencies, commercial enterprises and private businesses are not accepted.

Deadline is noon Wednesday, one week before publication.

FOR SALE

SAND DOLLY, for small boat, \$25. FR 5-8625.

HOUSE, Del Amo area, 3-yrs-old, 3-bdrm., 2 baths, lae. family rm., carpeting, drapes, block wall, \$26,500. 326-5874.

BEDROOM SUITE, silver fox finish, bookcase headboard, 2 night stands, lae. Mr. & Mrs. chest, dressing table w/ bench, lae. mirror, \$75; dinette set, yellow, \$20. FR 7-1094.

BUICK, Riviera Roadmaster, 1955 ori. owner, full power, \$495. FA 1-0020. A OLDSMOBILE, Super 88, 1958, 4-dr. h/top, p/steering & brakes, r/h, 4 new tires, \$850. AX 1-6042.

TRIUMPH TR3, roadster, 1960, r/h, low mileage, \$1450. FR 1-2531 after 5 p.m.

DOUBLE BED, frame, box spring & mattress, \$35; vacuum cleaner, GE, deluxe w/attach., upright, \$20; living room tables, 3, coffee, step-end, & corner, mahogany, \$35. OS 9-3013.

HOME, custom-built, all electric, insulated, in Lytle Creek Canyon, \$11,750. OS 5-3100.

TRAILER FRAME, 4'x7', welded, w/hitch, springs, wheels & tires, \$15. OS 6-1018.

TRANSCIEVER, Citizens' Band, executive model 100 w/microphone, crystals, 110V-12V-6V plugs & mobile antenna, \$160. DA 6-1572.

BOAT, 15' Sport Fisherman, cabin, Johnson 30 hp motor, fully equipped, trailer, \$450; bicycle, 24". boy's, balloon tires, \$10. 371-9730.

WHEEL, 15" w/8.20-15 tire and tube, \$6; record player, \$3; house, stucco, 3-bdrm., lae. rumpus rm., 2-bath, 2-car garage, sprinklers, corner lot, extras, 10% dn., \$19,995. NE 9-0242.

FORD, V-8 pickup truck, 1961, custom cab, long bed, \$1400; Pontiac convert., 1955, engine o/hailed, \$400. 675-7131.

CAMPING TRAILER, 14', sleeps 4, \$195. PL 8-5220.

MOTORCYCLE, 1962 Puch, 250 cc, \$360; tandem bicycle, 3-spd., \$80. OR 7-5617.

SURFBOARD, 35#, balsa, 8'6" 21" wide. \$30. FR 4-2835.

MOVIE CAMERA, Brownie, 8mm, w/ Mansfield wide angle & telephoto lens, \$20. OS 5-3660.

CAMERA, Kodak 616, folding F3.5 1-100, leather case, port. attach., \$7.50; Kodak 35mm, F3.5 1-200 rangefinder, case, flash equip. GE exp. meter, \$11.50; rifle, Rem. 722, cal. 222, sling, scope mt. base, \$60; Colt powder flask, pocket model, \$70; peace flask, U.S. mil., 70% ori., \$75. Box 901.

MOTORCYCLE, \$65; bicycle, boy's, 26", 3-spd., lite weight racer, \$20; boy's, 26", heavy weight, \$20; girl's, 26", \$20. PL 5-4497.

CONCERTINA, 505R4 American w/case, \$325. EX 1-4860.

RANGE, Hotpoint elec., \$75. 329-0259 after 5 p.m.

CHEVROLET, Impala, 1959, r/h, power steering, \$400 & take over \$1300 bal. at \$72 mo. FR 2-5293.

FOR SALE

PIANO, baby grand, Hamilton, mahogany, \$450. EX 1-4826 after 5 p.m. A

FORD, convertible, 1956, stick shift w/overdrive, \$425. Box 902.

GOLF CLUBS, 3 Wilson woods, 8 Kroyden irons, putter, bag & pull cart, \$35. FR 5-7822.

PORT-A-CRIB w/mattress, \$15. 325-1510.

KITTENS, Siamese, bluepoints, seal points, 7-wks-old, \$20 w/out papers; \$25 w/papers. OS 5-1842.

FORD, Falcon, 1961, 2-dr. sedan, r/h, stick shift, \$1125 or best offer. PL 6-7367.

WASHING MACHINE, Kenmore, wringer-type, \$15. EA 2-5136.

PLYMOUTH, Belvedere, 1956, \$475. PL 4-7628.

CABIN CRUISER, 18', Glenwood hull, Mercury MK75 eng., 2 bunks, 180 mile cruising range, tilt trailer, o/load springs 6-ply tires, \$1895. FR 5-2789.

TOOLS, woodworking hand, 50¢ to \$3; reflex camera, \$20; mangle, Kenmore, \$15; wood stove, \$20; 1/2" plastic hose, brass fittings, 25' \$2; 50' \$4; plateglass doors, \$1, windows, \$1; chaise lounge & pad, \$5; trailer icebox, \$2; meter box, lae. elec., \$25. OS 6-5253.

PIANO, 5' J. S. Brambach baby grand, 3-pedal w/base sustainer, bench inc., \$795; side curtains, rear, \$7.50 ea.; tonneau cover to fit MG-TD series, \$10 or \$20 for both. FR 2-8333.

DINING TABLE, walnut, 6 chairs, \$25; butane tank, 5-gal., \$10; hotplate aas, \$2; cartop carrier, \$3. OS 6-8066.

VOLKSWAGEN, Sunliner, 1961 2-dr. sedan, transistor radio, heater, w/w tires, \$1425. OR 7-4062.

MATERNITY CLOTHES, 2 suits & bathing suit, size 10. \$5. FR 4-3060.

CORVAIR 95, rampside pickup, 1961, new tires, 25,000 actual miles, \$1075. GA 2-4409.

RAMBLER, wagon, 1953, 2-dr., r/h, o/drive, \$225 or best offer. FR 5-4110.

CADILLAC, 1950, needs grille, \$100. 752-0029.

ENGINE, 1948 Mercury, rebuilt, 3 5/16x4 lsky cams, Edelbrock heads, w/carbs., new clutch, \$275; Ford trans., 1939, cadmium-plated case, new gears, \$45 or best offer. FR 4-5756.

RUG & PAD, 12'x15', wool, \$100. OS 5-4555.

AIR CONDITIONER, Emerson, 7500 btu., 110 volt, portable-type installation, \$75; jia saw, w/floor stand, hvy. duty, 1/3 hp motor \$35. 377-1274.

TYPEWRITER, Remington portable, \$20. AX 2-4958.

GO-KART, used very little, \$60. EA 2-3420.

RENAULT, 1961, black, \$780. OS 5-6081 after 4 p.m.

SLIDE RULE, circular, Binary, \$5; stop watch, Minerva Rally, \$15; master watch, Breitling navigator's, \$60. FR 9-1811.

PLYMOUTH, Savoy, 1956, 4-dr. sedan, automatic, radio, p/steering, \$300 or best offer. 376-3849.

HOUSE, modern, 3-bdrm., No. Torrance, 1 1/2 baths, elec. built-ins, carpets & drapes, patio & many extras, \$23,950. DA 3-8419.

HOUSE, 3-bdrm., 1 1/2 baths, carpets & drapes, covered patio, So. Torrance, \$22,500; drafting table, Kee, 40"x60", adjustable, cushioned chair, \$25. FR 5-3945.

POODLES, AKC regis., black, 2 females, \$70 ea. PL 4-3665 after 5 p.m.

RAMBLER, station wagon, 1960 Classic, 4-dr. super, htr., luqaage rack, \$1245. TE 3-4191.

WANTED TO BUY

FILING CABINET, 2 or 4 drwr., metal. GE 1-4233.

SHOTGUN, Matador, dble. barrel, full choke & modified selective ejectors. OS 5-1207.

RENTALS OFFERED

MOUNTAIN CABIN, 4-bdrm., 1 1/2 baths, furn., 3 miles from Lake Arrowhead Village, for vacationers June-Sept., \$65 week or \$200 mo. DA 4-5774 evenings.

APTS., sparkling new, carpeting, drapes, built-in range & oven, disposal, sliding glass door to private patio, pool, in foothills of Rolling Hills near Crenshaw & 101, adults, 2-bdrm., \$125 mo., 1-bdrm., \$100 mo. 326-0474.

APT., 2-bdrm., unfurn., stove & refrigerator avail., adults only, trash pickup pd., 2 blocks from Northrop, washing facilities avail., \$90 mo. OS 6-8283.

HOUSE, lae., 3-bdrm., 1 1/2 baths, dining area, built-ins, disposal, fireplace, 2-car garage, children OK, 12 min. from Northrop, available early July, \$160 mo. FR 4-2121.

DUPLEX, 2-bdrm., unfurn., water paid, adults only, \$100 mo. OR 1-6702.

DUPLEX, unfurn., upper, 2-bdrm., modern, private garage, water & trash pd., adults only, no pets, \$110 mo. OS 6-1985.

HOUSE, 2-bdrm., drapes, tile bath, laundry room, carport, near Northrop, \$110 mo. OS 6-6995.

Stamp Club In New Type Auction

An auction like you have never seen (or heard) before will be held by the Stamp Club at the next meeting, May 27, 7:30 p.m. at the NRC Clubhouse.

There will be no pounding of hammers and the going, going, gone routine. Just one bid and silence.

Claude Pike, Stamp commissioner, explains by saying that those at the meeting with stamps to sell should prepare them for bid by putting them in glassen envelopes, identify each package as to country with minimum price. The owner should assign his own number.

The packages will be on display for a specified time during the meeting. All those interested will be given sheets on which to write bids. At the end of the period bids will be turned in to a committee to determine the highest bidder on each package. The committee will then collect and turn over all money to the members who made sales.

Nor-Aid



CHAIRMAN — Roland B. Scott, staff assistant to director of Industrial Relations, has been appointed chairman of the Hawthorne Nor-Aid committee. Mr. Scott, in aerospace industrial relations work for the past 14 years, has been at Norair since 1961. A lieutenant colonel, Air Force pilot, retired, he saw service in Africa, Europe, holds the Purple Heart and Air Medal.

SILVER LAKES NRC CAMPOUT

All Northrop people are invited by the Camping Club, Max Douglas, commissioner, to attend the NRC campout May 25 and 26 at Silver Lakes, 5 miles north of Corona.

There will be fishing, horseback riding, children's rides and hiking. Camping fee is \$2 for each day.

A potluck dinner is scheduled for 5:30 p.m. Saturday. "Come prepared," says Max.

FOUND

CLASS RINGS, Torrance High School, 1953 & 1955; wedding band, large, gold. Lost & Found, ext. 1972.

PERSONALS

I WISH to express my sincere thanks to all the wonderful friends who were so kind & thoughtful during the loss of my wife. PAUL W. SANDERS.

FOR SALE OR TRADE

BICYCLE, Girl's, 26", Royce Royal, horn, lights, generator, pump, \$35 or trade for building material, studs, flooring, etc. FA 8-7945.

FORD, Fairlane, 1956 2-dr., auto. trans., o/hailed recently, \$425 or older auto. & \$300. FR 4-5603.

Girl Fridays Tour



SECRETARIES TOUR — National Secretaries Association Secretaries' Week provided Norair members of Airborne Chapter opportunity to stage a dinner and plant tour for 30 charming visitors. Photo shows Chuck Fleming, chief, Manufacturing Control, escorting Southland industry Girl Fridays to a balcony view of the new assembly line. First and second in front row from left are Mattie Lee Sherburne, secretary to Max Stanley, chief, Flight Support Operations and Dorothy Moore, secretary to Dick Nolan, Corporate vice-president and Norair general manager. The affair was coordinated by Mayme Colombo, chairman and secretary to Jack Mannion, Manufacturing manager; Jeri Lippert, secretary to Bob Lloyd, vice-president and assistant general manager, Operations; and Naomi VaNouse, secretary to Tom McCarthy, Administration manager.



BASKETBALL WINNERS — The Norair Elite, second time NRC basketball champs, receive trophies at NRC banquet. Guest of honor and speaker of the evening was Rudy La Russo, L.A. Lakers star. From left, front, Frank Wurga, John Massey, Terry Birdsall, Bill Greene, NRC Basketball commissioner; and Don Greco. Rear, L-R, Gary Bunn, Tom Lusk, Roland Sandberg, Mr. La Russo, Greg Halberg, and Walt Rusanoff.



HIGH HONORS — Rudy La Russo, 6 foot 7 1/2, 235-pound Laker presents most valuable player trophy to Greg Halberg (Norair Elite) and highest scorer trophy to Norair's John Ruttberg, who had a 26-point average. Awards banquet with wives in attendance and a big success was first such affair to be staged by the Club. Rudy, NBA rookie of the year for 1960, is from Dartmouth.

NORTHROP NORAIR NEWS

Issued biweekly by Norair Division of Northrop Corporation

• Wednesday, June 5, 1963

HAWTHORNE, EDWARDS AFB, PALMDALE

SAN ANTONIO, EL PASO

Northrop Shows Sales Gain For First 9-Month Period

Northrop Corporation had consolidated net sales of \$257,894,000 for the nine months ended April 28, 1963, compared to net sales of \$245,456,000 for the first nine months of last year, Thomas V. Jones, president and chairman, reported last week.

Net income for the nine months period was \$6,085,000, equivalent to \$1.45 a share. This compared with net income of \$6,307,000, equivalent to \$1.51 per share, in the first nine months of the previous fiscal year.

Backlog of sales at April 28, 1963, totaled approximately \$325,000,000 as compared with \$350,000,000 a year earlier.

"Our sales are running ahead of last year despite cancellation in December of the Skybolt project for which we were developing the guidance system, a very major program," Mr. Jones said. "Additional sales, combined with a company-wide cost improvement program, have maintained our

earnings at a level close to last year's, even though last year's earnings for the comparable period included a substantial amount of 'other income' which was taxable at capital gains rates," he stated.

In the third quarter of the fiscal year the company had sales of \$84,598,000 and net income of \$2,163,000, equivalent to 52¢ per share. In the third quarter of the previous fiscal year net sales were \$87,907,000 and net income was \$2,337,000, equivalent to 56¢ per share.

Northrop's sales and backlog include T-38 supersonic trainers for the Air Force, F-5 tactical fighters for the Military Assistance Program, electronic and optical equipment for the Polaris missile and submarine program, the X-21 development program to perfect the laminar flow control system for aircraft, and the landing and recovery systems for the Mercury, Gemini and Apollo space programs.

Science Center Displays Tell "What's New" Story

Technical personnel vote the engineering displays being continuously shown on the second floor of the Science Building, column 14H, to be high in interest, easy to look at, and a fine aid in keeping informed on what is new in aerospace equipment and materials, and processes.

The displays, coordinated by L. R. Clayton, Value Engineering and Logistics branch, are changed each two weeks.

Exhibits include new materials and their application, structural and system hardware, modern manufacturing processes and techniques, and similar items of interest to Technical people. Recent displays showing items being incorporated into Norair de-

signs include high purity castings, electro-deposited nickel, honeycomb applications, the use of plastics and sealants, hydraulic and electrical components and metal finishes.

Showings also demonstrate Norair's own research and development capability such as micrometeorite penetration studies and electron beam welding techniques.

Suggestions for suitable displays are solicited from all Norair groups and Northrop divisions. Likewise, requests to transfer these displays to other areas can be readily arranged with the respective vendor or responsible Norair organization.

Mr. Clayton's telephone is 1815.



SEE, FEEL, KNOW—Typical engineering "what's new" display, as being regularly shown on second floor of the Science Center. This one is courtesy MESA Plastics Company. In photo, Don Herrick, Mechanical Design, and Lew Clayton, Value Engineering. Technical people give high interest vote to exhibits which are changed each two weeks. Display was coordinated by Mr. Clayton and Henry Wiel, Materials Engineering. (See story.)

NRC ART SHOW AT CAFETERIA PRESENTS TOP TALENT ARRAY

Today is the first day of the NRC Art Show in the Plant One cafeteria.

For two weeks, through June 19 the creative work of the people of Norair will convert the establishment into an art gallery, par excellence and with an artistic back seat taken for no one; Taos, San Francisco, Greece, and the Left Bank included.

John Kayser, NRC Art Club commissioner, reports that this

show, the 15th annual, measures up handsomely to all other previous shows in variety and perfection of canvasses submitted.

"Art Show visitors," states John, "will see modernistic, impressionistic, realistic, and abstracts. Practically the entire spectrum of artistic expression makes up the show."

"Subjects of the paintings range far and wide; portraiture,

still life and industrial activity are represented. Deserts, harbors and boats, seascapes and the countryside are displayed."

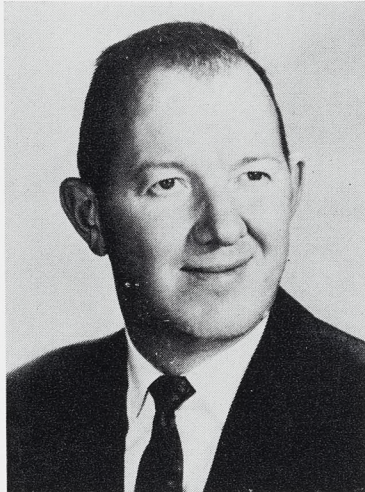
Competition for the show was open to all Norair and Nortronics ES&E personnel, their families included. There are three principal classifications: oil, water color, and dry mediums.

Highlight of the show takes (Continued on Page 5)

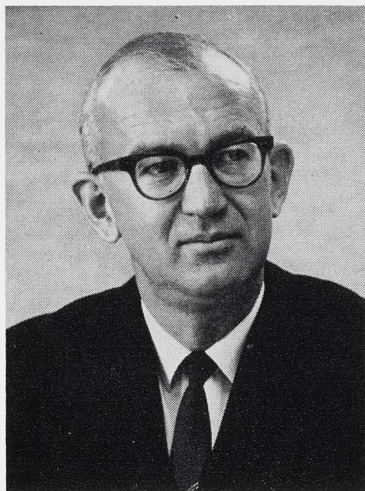
Two New V-Ps Named by Northrop

Northrop Corporation has named Glenn R. Lord and Ward B. Dennis to become Corporate vice-presidents, it has been announced by Thomas V. Jones, president and chairman of the board.

Mr. Lord will be Corporate



GLENN R. LORD



WARD DENNIS

vice-president, Marketing, and Mr. Dennis will be Corporate vice-president, Development Planning.

Mr. Lord has been the chief marketing executive of the Raytheon Company and prior to that was general manager of the company's Equipment Division. He was previously an executive of the Bell Aircraft Corporation and the General Electric Company.

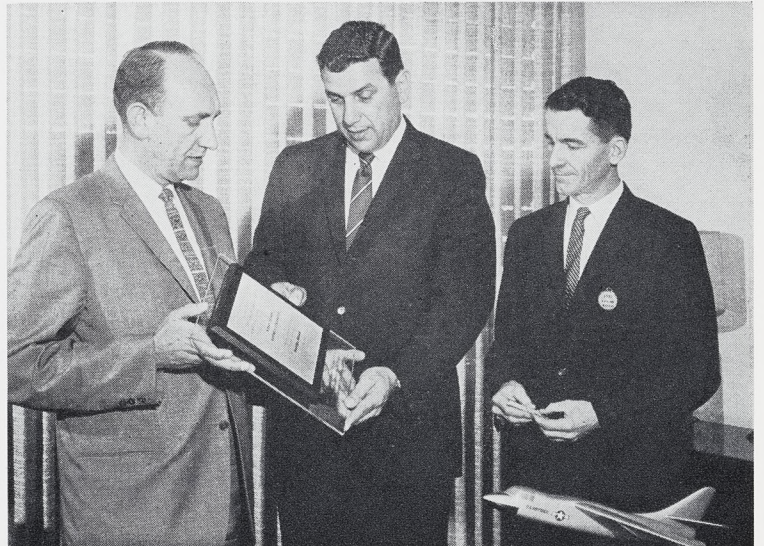
Presently a resident of Welles- (Continued on Page 2)

Bond Honor for Dayton



FIRST WITH THE MOST—Northrop Corporate Central Regional office, Dayton, is proud to discover they were the first to report 100 per cent in Northrop's highly successful Freedom Bond drive. Photo shows office manager Bruce MacDonald reading congratulatory message from Bill Habblet, Corporate special assistant to the president, apprising them of the fact. Mr. MacDonald is flanked from left by staff members Karen Archer, Bea McClintock, Shirley Dolphin, Cindy Kenton, and Betty Shoup.

Design Award for X-21



DESIGN EXCELLENCE AWARD—A special plaque in recognition of excellence in engineering design is presented to Welko Gasich, Northrop Norair vice-president and assistant general manager-Technical, by Ed W. Schrader (left), West Coast editor of Design News. The plaque was awarded by the magazine for Northrop Norair's design of the ducting system for the application of Laminar Flow Control to the X-21. At right is Kenny Rogers, engineering specialist in the Aeroscience group, LFC Demonstration Airplane Program department, who was responsible for much of the suction system design. In his hand is a tributary duct, of which he was co-inventor along with Dr. Werner Pfenninger. The LFC wing tributary ducts provide proper distribution of air into the wing slots. The plaque is on permanent display in the Engineering and Science Center lobby.

Concrete Citizenship

In this issue of the Northrop Norair News, your Editor is publishing a map showing legislative districts in the Southern California area and a list of our County elected officials in Washington, D.C. and Sacramento.

I fear that many of us will adopt the attitude that as an individual your letter will have little or no influence on legislative

By John B. Clark

policy at the national or state level. I must confess that in my formative years I too shared this general attitude and made the mistake of expressing this opinion to one of my boyhood idols



whom I grew up with in New York. This associate, who had chosen to enter political life, proceeded to give me a lecture on some of the major decisions made in the national congressional arena in Washington that were based in whole upon the individual letters lawmakers had received from grass root constituents. I have never forgotten this lecture and, in view of the fact that the lecturer was former Postmaster General James A. Farley, I feel his summation of concrete citizenship is thought-provoking for all of us.

Jim stated, "Every citizen of the United States has a duty to inform his elective officials of his personal feeling on matters which personally touch upon him or on

matters in which he has personal knowledge."

This is one of the best ways to preserve our democratic system. Over the years I have come to wholeheartedly agree with Mr. Farley. I, therefore, urge all Norair personnel to make use of the tools your Editor has provided.

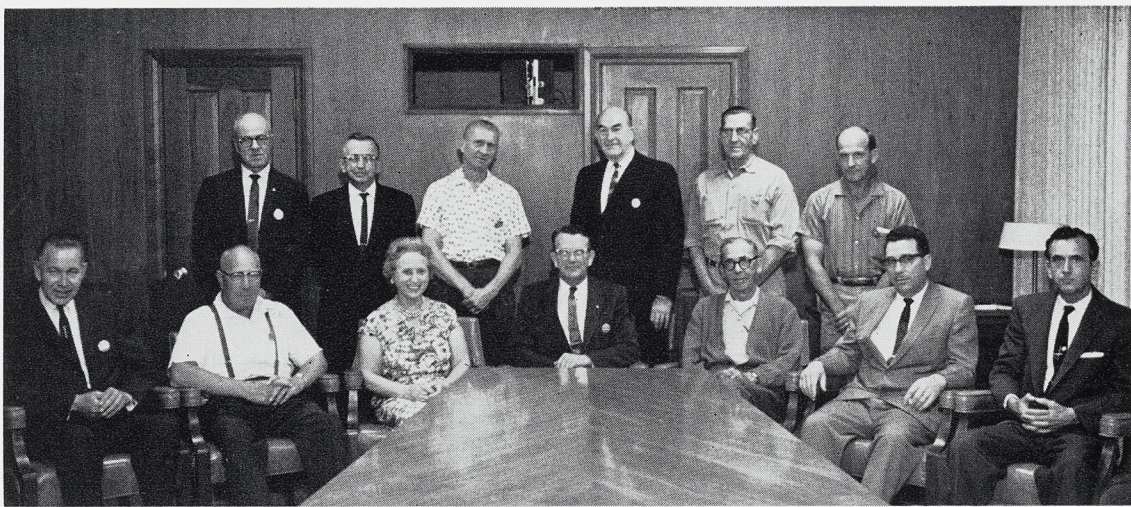
To the distaff side of our Norair family, I wish to point out some pending legislation in Sacramento which, from the number of phone calls we have received in Industrial Relations, must be an item of concern.

I am speaking now of the fact that since September 1961 women have not been able to work over 8 hours in one day or more than 48 hours in one week by virtue of the cancellation of the Defense Production Act in California which previously had allowed women in the defense industry to work 10 hours a day or 54 hours a week or 6 days in one week.

If the cancellation of the Defense Production Act has affected you adversely or if you feel that members of your sex should not work over 8 hours in one day, you should be aware of the fact that at the present time before our lawmakers in Sacramento there is:

1. Assembly bill 983 which will, if passed, reestablish the Defense Production Act allowing women to work 10 hours in one day or 54 hours in one week.
2. Assembly bill 984 which will prohibit all women within the State of California from working over 8 hours in one day or more than 40 hours in one week.

Diamond Pins for 20-Year Folk



TWENTY-YEAR CEREMONY — Here Norair 20-year folk meet with Dick Nolan, Corporate vice-president and Norair general manager, in the board of directors room, Administration building, to celebrate 20 years of Northrop service and receive their diamond-studded pins. Present for the occasion from left are, seated, George Cooper, Wesley Carr, Mary Forde, Mr. Nolan, Einer Reinholdson, Barney Taylor, and Charles Wheeler. Standing, from left, Otto Falk, Wallace Bishop, Andrew Puska, Alvin Fierce, Arnold Straub, and Ralph Collins. Mr. Nolan gave informal briefing on Division progress and programs and discussed important events that have transpired during the two decades. Norair 20-year count numbered 742 persons on April 15.

3. Senate bill 1158 which will allow all women, whether in defense industry or not, to work 10 hours a day or 54 hours a week.

Thus, it would appear ladies, that our legislators have thought of every potential combination. Now, all that is needed is for you to let them know what your individual desire and feeling is.

I am sure that if the distaff side of the family practices "concrete citizenship" it will not be long before the man in your life follows your good example. This would mean democracy at work.

The best way to keep informed politically for both men and women is, of course, to read your daily newspaper, listen to the public affairs programs on television, and give time and ear to the radio commentaries.

Concrete in the sense we use it means real. Real citizenship implies good citizenship. Good citizenship must be productive.

Your opinion is as important as your vote.

Corporate

(Continued from Page 1)

ley Hills, Massachusetts, he will make his home in the vicinity of the Northrop Corporation headquarters in Beverly Hills. He is 43 years old and graduated from the University of Rochester in 1943.

Mr. Dennis has been Corporate director of Development Planning since October 1958.

He joined Northrop in 1953 as assistant chief of Weapons Systems Analysis. Prior to this he was an operations analyst at the RAND Corporation, Santa Monica, 1950 to 1953. He was also a professor of aeronautics at the U.S. Naval Postgraduate School, Annapolis, Maryland, from 1947 to 1950. In 1945 and 1946 he was employed as a development engineer at the Cornell Aeronautical Laboratory, Buffalo, New York, where he conducted some of the early tests on ram jet and pulse jet propulsion systems.

Mr. Dennis received his bachelor of arts degree, aeronautics major, from the University of Minnesota, and his master of science degree in aeronautics from the University of Michigan. Mr. Dennis also engaged in advanced studies at Johns Hopkins University. He is 41 years old.

Know Your Government

County Elected Officials—Washington & Sacramento

UNITED STATES SENATORS
CLAIR ENGLE (D) THOMAS H. KUCHEL (R)
Senate Office Building
Washington 25, D.C.

CALIFORNIA STATE SENATOR
THOMAS M. REES (D)
State Capitol
Sacramento 14, California

Note: County of Los Angeles constitutes the 38th Senatorial District.

LOS ANGELES COUNTY
CONGRESSMEN and ASSEMBLYMEN
Showing Assembly Districts comprising each Congressional District.

Congressional District	United States Representative	Covering Assembly Districts	State Assemblyman
17	CECIL R. KING (D)	67	CLAYTON A. DILLS (D)
		68	VINCENT THOMAS (D)
19	CHET HOLIFIELD (D)	51	JOHN MORENO (D)
		66	JOE A. GONSALVES (D)
20	H. ALLEN SMITH (R)	43	HOWARD J. THELIN (R)
		47	FRANK LANTERMAN (R)
21	AUGUSTUS F. HAWKINS (D)	53	MERVYN M. DYMALLY (D)
		55	F. DOUGLAS FERRELL (D)
22	JAMES C. CORMAN (D)	41	TOM C. CARRELL (D)
		64	LOU CUSANOVICH (R)
23	CLYDE DOYLE (D)	38	CARLEY V. PORTER (D)
		52	GEORGE A. WILLSON (D)
24	GLENARD P. LIPSCOMB (R)	49	HOUSTON I. FLOURNOY (R)
		54	JOHN L. E. COLLIER (R)
25	RONALD B. CAMERON (D)	50	PHILIP L. SOTO (D)
		58	HARVEY JOHNSON (D)
26	JAMES ROOSEVELT (D)	59	ANTHONY C. BEILSONSON (D)
		61	LESTER A. McMILLAN (D)
27	EVERETT G. BURKHALTER (D)	42	TOM BANE (D)
		62	TOM WAITE (D)
28	ALPHONZO BELL (R)	46	CHARLES EDWARD CHAPEL (R)
		57	CHARLES J. CONRAD (R)
		60	ROBERT S. STEVENS (R)
29	GEORGE E. BROWN, JR. (D)	45	ALFRED H. SONG (D)
		48	GEORGE E. DANIELSON (D)
30	EDWARD R. ROYBAL (D)	40	EDWARD E. ELLIOTT (D)
		56	CHARLES WARREN (D)
31	CHARLES H. WILSON (D)	63	DON A. ALLEN, SR. (D)
		65	JESSE M. UNRUH (D)
32	CRAIG HOSMER (R)	39	GEORGE DEUKMEJIAN (R)
		44	JOSEPH M. KENNICK (D)

Communications with your United States and California State legislators are as important this year as ever. Many bills that touch our economic and social existence are being introduced.

In California alone, legislators will make more than \$3 billion worth of decisions this year and the way they vote will have a profound effect upon every citizen, every business, and our state's "employment climate".

Legislative elected officials work at the Capitol in Washington and Sacramento during the entire session. They have little opportunity to contact constituents unless constituents contact them. Each one of us has an obligation to make our views known

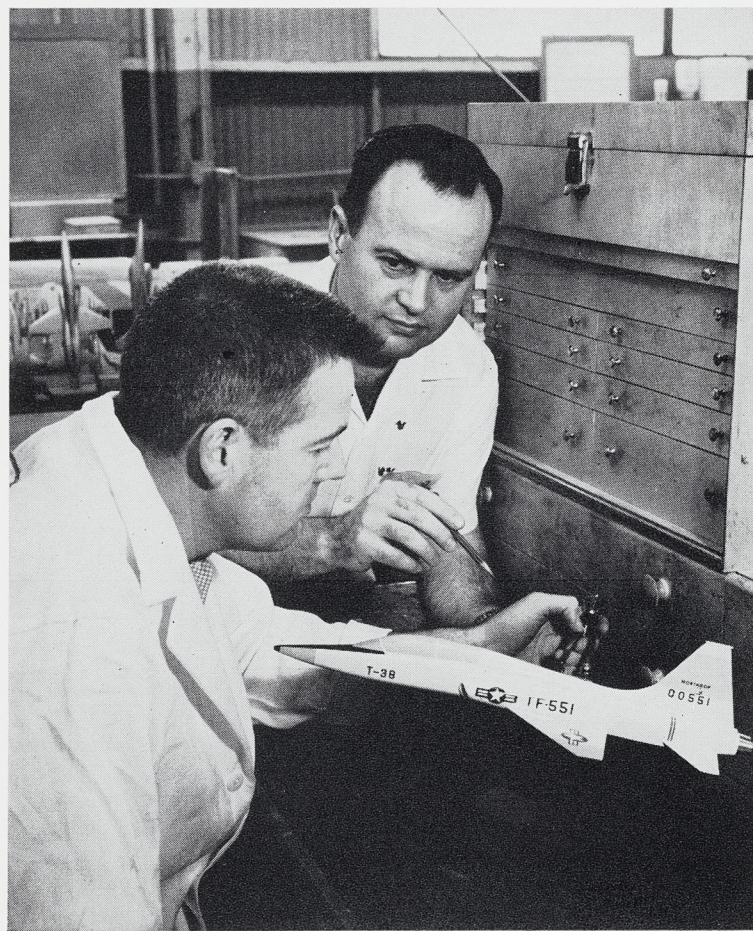
NORTHROP NORAIR NEWS

VOL. 21 NO. 10

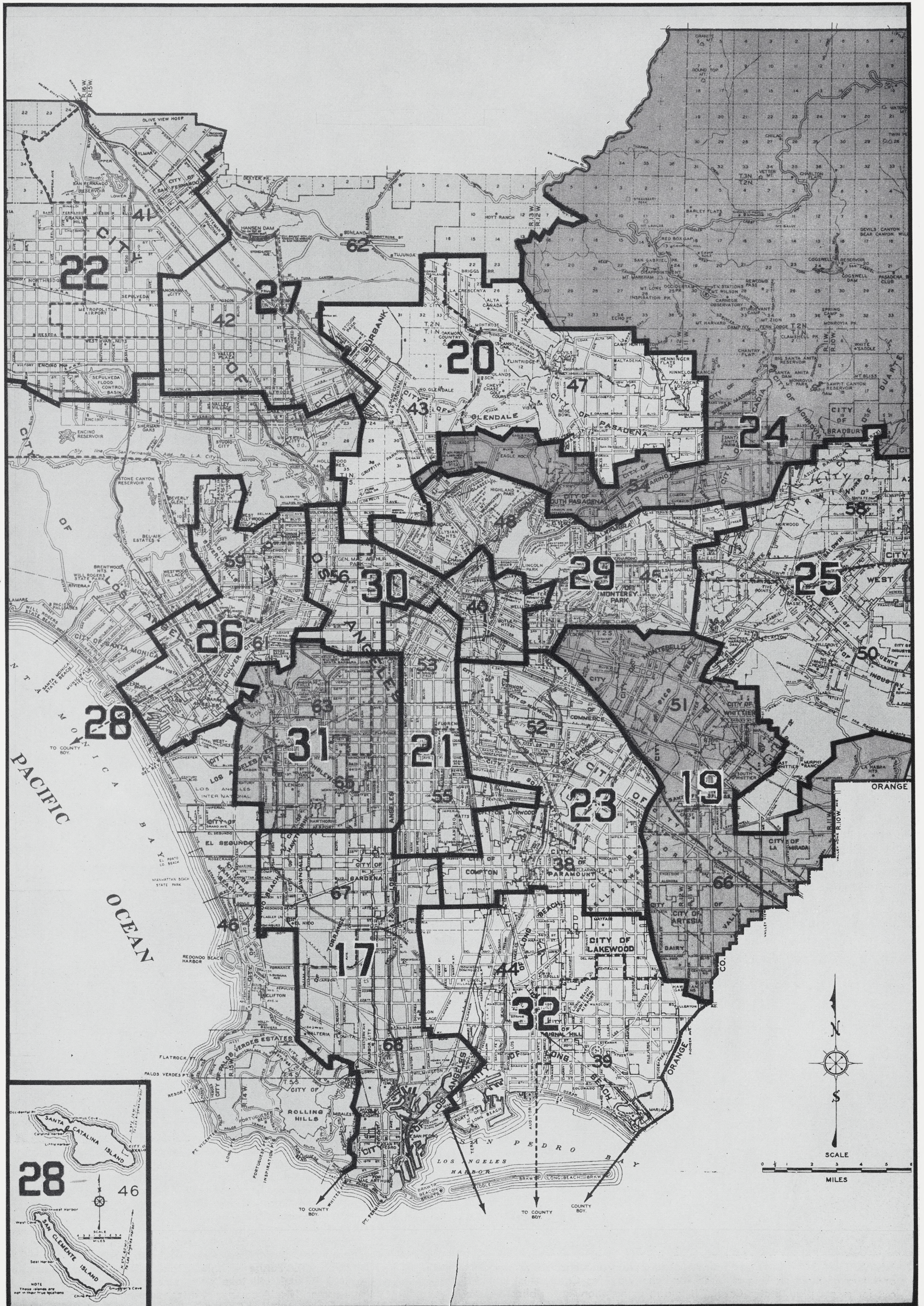
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NORAIR DIVISION
Published every other Wednesday

CHARLES BRADFORD, Editor

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HEADED FOR SMITHSONIAN—A scale replica of the T-38 Jacqueline Cochran flew to eight world records for women in 1961 is shown prior to shipping to the Smithsonian Institute's National Air Museum in Washington, D.C. There the model will become part of a special display designed around the accomplishments and records of Miss Cochran. Putting the finishing touches on the model are Northrop Norair's Pete Garrigan (left), and Wally Henrich, Model Shop Fabrication foreman. Model builders Ed Landry and Chuck Chamberlain helped in fabrication of the model.



Her Victory Over Darkness Draws Spotlight of an Adoring Public

Pearl Hardacre's daughter, Carol, has just received nationwide recognition for the excellent job she is doing in teaching kindergarten.

Mrs. Hardacre is a 20-year Norair employee in Cost Accounting. She received her diamond-studded pin this year. See Northrop Norair News, March 27.

Daughter Carol, 23, is one of the only 100 blind school teachers in the United States, and so professionally successful that Look Magazine, April 23, presented a 4-page story pictorial of her life and work.

Also, Paul Coates, Channel 11, had Carol on his program to ask about the problems of being sightless.

"Blindness is a nuisance," she stated to Look, "but it is not the greatest handicap a person can have."

Look's photos of Carol and her doting pupils at Van Wig School in La Puente prove that this can be true. Of the particularly touching views of Look photographer Earl Theisen, one shows Carol tying the shoe laces of one of her hard-playing charges. Another shows her in the process of teaching an enchanted young miss how to use scissors.

Carol, who lost her sight through cataracts and myopia, was 3 when her mother came to work at Norair. The young lady made up her mind at age 11 to teach. Her sight deteriorated to almost total darkness after that.

Mrs. Hardacre and her daughter were undaunted in the face of this seemingly insurmountable misfortune. A good life for Carol became their greatest challenge. The cost as with all worthwhile things was sacrifice and hard work.

Pearl first sent her daughter to the Orientation Center for Adult Blind at Oakland. There, related Look, she learned Braille with speed, to cook, sew, travel, or "do anything I wanted." Pearl then put her daughter through Whittier College.

Carol told Look, "It is a misconception that a blind person is doomed to an idle, lonely and dependent life. The blind are capable of full and rewarding

lives. In teaching, blindness has nothing to do with whether one is a 'good' or a 'poor' teacher. California alone has 36 blind teachers in the public and parochial schools. The important thing is that they are hired not out of sympathy, but because



PEARL HARDACRE

they are eminently qualified to teach.

"After all," concludes Carol, "sight is not the key to life."

Her dedication has not been without reward and personal satisfaction. Carol is a member of the California Scholarship

Society. She is also a member of Whittier College's Grand Alpha Chapter, Delta Phi Upsilon, national honorary society for childhood education. A high honor, this distinction is based on consideration of character, scholarship, leadership, and professional attitude.

Fact, a new honor came to Carol just last week. She was named "Teacher '63 of the Week," by the California Teacher's Association.

In addition, the publicity, sometimes a weary business even to those who court it, has brought Carol another blessing she can count. Southern California eye surgeons, some of them famous the world over for their miraculous work with the blind, are studying Carol's case anew. There is a chance that new techniques just might—

And like everyone else Carol has her "outside" activities. Hobbies, if you will. She has studied voice since she was 8 years old and is a soloist at the La Puente Methodist Church and a member of the choir.

The News salutes two brave people. Pearl Hardacre and daughter Carol. Theirs is a fine victory.



WONDERS OF THE WORLD—Carol Hardacre, sightless daughter of Norair's Pearl Hardacre, Cost Accounting, takes her kindergarten charges at Van Wig School through their first steps along the road to education. This seems to be a coloring session. Carol was recently written up in Look, named "Teacher '63 of the Week" by the California Teacher's Association. Someone here seems to be making faces at Dave Saldana, photographer.



MISTER MAGOO—Mr. Magoo (term of toleration and endearment for the white stick) and two of the Van Wig children lead the way for Carol as she takes everybody out for recess play. States Carol, "It is a misconception that a blind person is doomed to an idle, lonely and dependent life . . ." A visit to her classroom in which she so adroitly weaves the spell of learning about the lives of eager 5-year-olds, is proof.



Northrop Corporation

*Northrop Norair News. Vol. 20, 1962.
(Bound).*

The Library of Congress has received as your gift the material described on the opposite page.

Your interest in the Library of Congress is sincerely appreciated and your generosity in presenting this valued addition to its collections is gratefully acknowledged.

L. Amory Trumbull
The Librarian of Congress

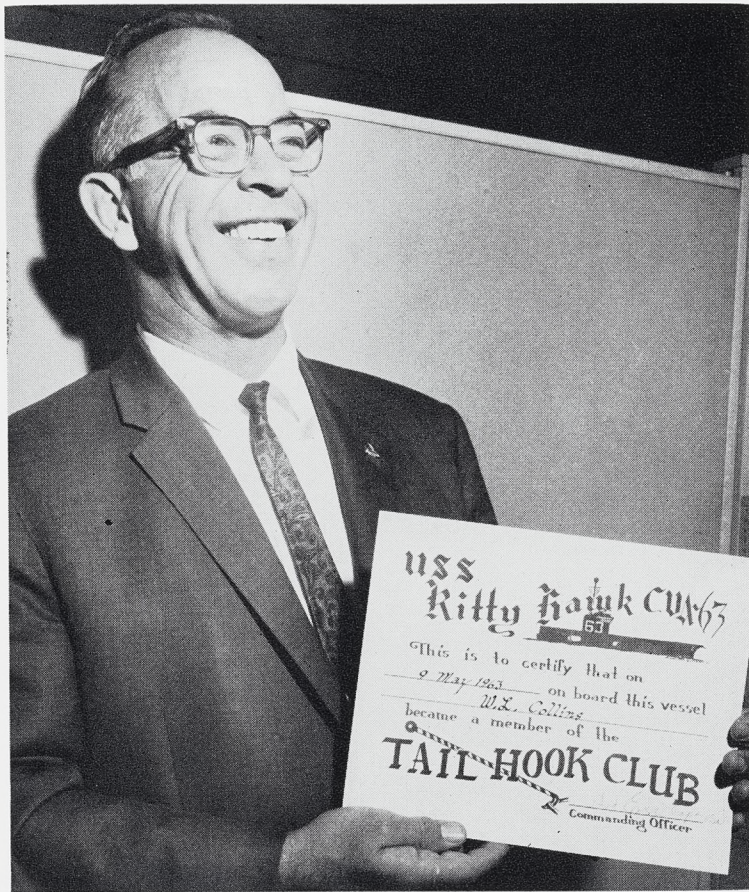
FOR ALL TIME—Northrop Norair News Volume 20, 1962 (bound), as with other volumes gone before, is now on file in the Library of Congress and becomes a permanent part of the literature and history on the nation. The last issue of Volume 20, Number 26 was published January 16, 1963. Headline story was about the new assembly line and the thousands of Northrop people who gathered to hear Northrop Chairman of the board and President Thomas V. Jones and Dick Nolan, Corporate vice-president and Norair general manager, give pre-holiday report on Company progress.

High Honors



A TOP ACHIEVER—Richard Witteman, holding one of his Junior Achievement company's products, is shown after being named top JA manufacturing vice-president for the greater Los Angeles area. Witteman won out over four other finalists in a contest sponsored by the Norair Management Club. Judges, left to right, are Ed Laski, M-C president and supervisor, Blueprint Control; Al Bin-sacca, NSL, M-C ex-president; and John S. Breneman, manager, night Operations. Richard received a trophy at the JA "Future Unlimited Banquet" at the Palladium, May 9, and will take part in national competition this summer. His JA company, a teenager-operated miniature corporation called Cerco, manufactured ceramic ashtrays, lipstick holders and mugs.

Kitty Hawk Visit



TAIL HOOK MAN—Norair's Warren Collins, supervisor, Laminar Flow Control Propulsion Systems Engineering, brings home coveted document from USS Kitty Hawk that certifies he is a member of the Tail Hook Club. Signed by the Kitty Hawk's commanding officer Captain Horace Epes, jr., such certificates are given only to those who make a landing aboard a Naval carrier. Mr. Collins with 16 members of the AIA Powerplant Installation committee visited the big flattop for observations of day and night flight operations. They were shown the Kitty Hawk's airborne strength going through operational maneuvers, the launching and recovering of aircraft, plus a ship tour including the modern jet engine test stand.

New Company Signature — News Adds Masthead Color

Something new has been added.

As if readers haven't noticed, the News masthead has a second color, Northrop blue, plus a change in type design both to conform with Northrop's new signature system.

The blue is known to us as Northrop Blue. It is listed for printers, artists and production men in "A. E. Handschy's Color System," as Opaque Blue, swatch CS-862 (for flat or offset) and CS-862-L (for gloss or letter-press).

The type has been specially designed for Northrop Corporation and divisional trademark and signature usage under the direction of Norman Warren, Corporate director of Public Relations and Advertising.

The new trademark is simply the word Northrop, in the specially designed type face. The authorized signature system calls for the use of this trademark, together with the names of the various divisions and subsidiaries which will be displayed in the same new type face but in a lighter shade or second color.

No further application of former trademarks or divisional symbols is to be made.

Insignia to be discontinued includes the Northrop bird used as the corporate trademark, as well as all other emblems previously used by divisions and subsidiaries.

There are many reasons for the change. The major one is that establishing corporate identity requires consistency in the use of the corporate name. It is true that each company unit has

an identity of its own. But just as Northrop is strong because of the strength of its divisions, each division is stronger as a part of Northrop than it could be alone. Therefore the word Northrop belongs as a part of every unit signature.

Discontinuance of the bird trademark and other conflicting symbols is an essential part of the plan for achieving quickly recognizable corporate and divisional identity. Although trademark symbols offer the recognition value in the selling of consumer products, many tests have demonstrated that the use of abstract trademark symbols by companies tends to confuse rather than clarify identity. This is particularly true when one company employs six different symbols, each serving only to cancel out the strength of the others. The most meaningful and quickly identifiable trademark for Northrop is the name Northrop itself, associated with the names of its divisions and subsidiaries.

The Northrop Norair News, a publication of wide circulation among employees, with copies mailed to selected officials and offices in customer circles, prides itself on its part in bringing the Northrop and Northrop Norair story to many people each year. The new masthead will assist materially in helping outside readers to identify and remember the work of our aerospace team.

New format and color scheme for business cards has been issued. If there are questions on signature usage, Norair supervision should call Administrative Services, extension 2641.

Air Force Gives Water Safety Tips

Air Force safety officials this week released safety hints received from the American Red Cross aimed at curbing summer-time boating and swimming accidents. One and all vacationers will find this advice applies.

Quoting Red Cross Water Safety Services Director, Alfred W. Cantwell, officials said that more than 6500 Americans die in water sports activity each year, the majority in swimming and boating mishaps.

"Most of these tragedies could have been averted if the victims and their companions had known and followed safe practices," Mr. Cantwell said.

The list contains safety hints for swimmers, boaters, water skiers, and skin and scuba divers.

Mr. Cantwell's first caution on safety in the water was "Don't try to swim too far too soon." A swimmer going into the water for the first time this year must realize his endurance is not the same as at the end of last summer, he said.

He also warned of the great danger of games in which young people vie with each other in holding their breath for long periods under water. "Carbon dioxide builds up in the blood stream and brain when the breath is held, and too much carbon dioxide leads to unconsciousness."

Other safety tips include:

Swimmers and boaters

- Swim with a companion and where there are lifeguards.
- Avoid swimming when overtired, overheated, immediately after eating, and during electrical storms.
- Don't run or engage in horseplay around a swimming pool.

- Fence in home pools to preclude small children falling in.
- Don't dive in shallow or unfamiliar water.

- Watch for riptides and strong currents in ocean and river swimming.

- Insure that your boat is equipped with required safety devices.

Water skiers

- Wear a life jacket when skiing.

- Don't ski in shallow water or at night.

- Don't wrap tow rope around your body.

- To stop, sit down in water. If falling, curl up in a ball.

- Have two people in tow boat, one to drive, one to watch.

Skin and scuba divers

- Be sure you are a better than average swimmer and can swim 300 yards, tread water for three minutes, tow an inert swimmer for 40 yards, stay afloat 15 minutes, and swim under water 15 yards.

- Dive with a companion and establish a system of communication with him before diving.

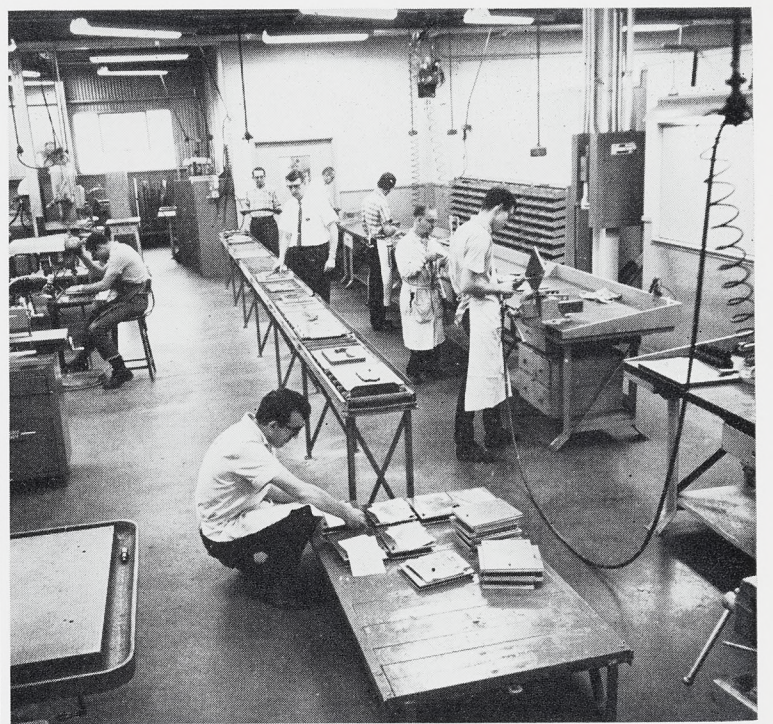
- Wear an inflatable flotation device.

- Descend at a rate that permits equalization of pressure in ear and sinus spaces.

- Ascend slowly and look up. Always exhale when ascending.

- Never dive with a cold, sore throat or sinus condition.

- If you're new at the sport, enroll in a class for skin and scuba diving.



DIE-MAKING ASSEMBLY LINE—Assembly line die-making team in 5216 is shown at their stations producing blank and pierce dies for the F-5 and the T-38. At left, front to back, Wayne T. Holdaway and James P. Whalen, jr. (at drill press). Foreman Charles L. Pearson stands at the roller conveyor. In background, Albert C. Winney, holding die. At bench stations, front to back, Claude E. Edington, Harold Elson, Ernest L. Wordley and Dale J. Adkinson. Note spick-and-span appearance of 5216 work area.

ASSEMBLY LINE PAYOFF FOR TOOL, DIE SHOP

Assembly line techniques are paying off in Organization 5216. Tool and Die shop, it is announced by John Shanelec, superintendent, Tool Fabrication.

In an operation normally identified with handcraftsmanship and a single individual making the entire die from start to finish, a roller conveyor and separately manned stations for specific operations has increased capacity and substantially reduced manufacturing cost of blank and pierce dies for the T-38 and F-5 contracts.

The improvement stems from a thorough analytical breakdown of die-making processes by Tool supervision into simplified operations that fit into the modern production line concept. Completion of assigned work at each station reduces the time and motion required to a minimum.

The many trips to the Tool Store for drills, fixtures, and other die-making aids under the

former one man to a die method are eliminated as each station is permanently equipped with all tools necessary to perform a particular function.

Die-making under the new method is divided into six general operations according to Russell L. Smith, general foreman, Template and Form Tools shop.

1. Scribe saw and file punch. Select mounting plates and identify.
2. Scribe and saw die.
3. Attach punch and die to mounting plates.
4. Drill holes for pierce punches and install.
5. Sharpen blank punch and flame harden.
6. Dies forwarded to press room for shear-in and try-out.

Approximately 1200 dies for the fighter and the trainer will be processed through the 5216 "assembly line" during the next four-month period.

Management Club Meeting—Les Richter is Guest Speaker

The Northrop Management Club will hold a dinner meeting Friday night, June 7 at the Airport Marina Hotel, it has been

announced by Ed Laski, president.

The Airport Marina Hotel is at Lincoln and Manchester.

Guest speaker will be Les Richter, famous University of California and Los Angeles Rams football star, now assistant coach of the Rams.

Entertainment personnel will include Don Rice, professional master of ceremonies, Margo Wade, dancer; and the Madcaps with their hilarious harmonica act.

Santa Monica patron of the arts and a painter in her own right.

Lawrence McCaray and Harold Winstrom of the El Camino College Art department.

After the show has completed its tour at Norair, it moves to Nortronics Palos Verdes cafeteria to continue, June 24 through July 1.

Art Show

(Continued from Page 1)

place on June 11 when Division art lovers will conduct a sweepstakes vote to decide which painting has the most popular appeal. Also during the show a jury of professional artists will come to Norair to select the paintings that they think are the best.

Mr. Kayser reports to the News that the jury will be composed of:

Audubon Tyler, a leading Southland illustrator and long associated with the Art Center School. Mr. Tyler is noted for his rendition of Dorian Grey—the young Dorian Grey.

Mrs. William A. Wintrow, a



RIDES WANTED

7 a.m. — 3:45 p.m.

PECK & MATHEW AVE., Manhattan Beach. Orville T. Yarbrough, FR 2-4269.

CARSON & MOODY OR CRESCENT & MOODY, Cypress. Al Kurpiuweit, 828-9128.

7:30 a.m. — 4:15 p.m.

WARNER & BEACH BLVD., Huntington Beach. A. L. Nolder, 4246, 2207, 847-6286.

HAWTHORNE BLVD. & COMPTON BLVD., Lawndale. James W. Malarky, ext. 249, EA 2-2510.

8 a.m. — 4:45 p.m.

MENLO AVE. & ALONDRA BLVD., Hawthorne. Vernon L. Johnson, DA 7-0219.

HERMOSA AVE. & 1ST ST. OR 2ND ST. & MANHATTAN AVE., Hermosa Beach. Dorothy Bonham, ext. 1712, 376-9704.

RIDES OFFERED

7 a.m. — 3:45 p.m.

CARSON & MOODY OR CRESCENT & MOODY, Cypress. Al Kurpiuweit, 828-9128.

BBSF Classified Ads

BBSF classified ad service is provided free of charge to all Northrop Norair personnel.

Ads for agencies, commercial enterprises and private businesses are not accepted.

Deadline is noon Wednesday, one week before publication.

FOR SALE

TYPEWRITER STAND, hvy. duty for stand-ard or elec., locking, 2 leaves. \$25. AX 1-6653.

RADIO, AM-FM Packard-Bell, 9 transis-tor, portable w/case, batteries, ear-phones, \$45. VE 7-3671.

BEDROOM SUITE, silver fox finish, book-case headboard, 2 night stands, lae. Mr. & Mrs. chest, dressing table w/ bench, lae. mirror, \$75. FR 7-1094.

SURFBOARD, Jacobs custom, lime, red-wood strip, 8' 11" long, \$55. FR 8-1732.

TENT TRAILER, Heilite, extra tire & wheel, slide-out kitchen, Coleman stove, \$325; outboard motor, Martin, 7.5 hp, \$55. 833-8286.

HEALEY, 1960, deluxe model, o/drive, wire wheels & jump seats, \$1995; Bora-ward combi. station wagon, 1959, 4-spd. trans., under 40,000 miles. \$495. OW 7-3328 after 6 p.m.

AIR CONDITIONER, 2.5 hp, 220 v., Gib-son refrigeration unit, \$250. CR 4-7996.

CHEVROLET, 1959 Impala, convert., full power, \$1350. NO 3-7262.

REFRIGERATOR, Hot Point, w/freezer, 10 cu. ft., \$80. FR 7-3487.

DREDGES, aold, 2, 6" underwater unit w/5/8 hp. Briaas & Stratton, Johnson compressor 4" surface unit w/9.8 hp Pacific marine motor & pump, 12' sluice box, many extras, \$750; single bed w/ mattress & box spring, \$20. 376-8529.

STUDENT DESK, walnut stained, 4-dwr., \$15. FA 8-0460.

FORD, 1925 touring, \$475; Cadillac, 2-dr. h/top, all power, factory aircond., new trans., \$1125. DA 4-2145 after 5 p.m.

LAWN MOWER, rotary-type, 22", \$25; intercom, 2 speakers, \$15; stamp ma-chine, store-type. \$20. DA 4-3611.

RADIO & SPEAKER, 1957, push-button type. \$19.95. 371-0468 after 4 p.m.

PIANO, spinet, mahogany, \$200. EA 2-4747 evenings.

MG, twin cam, new Pirelli tires & bat-tery, soft & h/tops, \$1075. TE 3-6761 after 7 p.m.

FORMALS, size 8-9, white w/green vel-vet strap, street length, \$10; white, strap-less, floor length, \$15. UN 4-5120.

FURNITURE, Lawson love seat, early American. \$60. 326-5471.

HOUSE TRAILER, Aljoa, 13', 15 aol. water tank w/pump, stove, storage space, water & elect. connections, \$250. OS 6-8321.

CAMERA, 35mm Praktika SLR. f:2 Zeiss Biotar lens & case. \$25. PL 6-8413.

FORD, 1956 h/top, T-Bird eng., 49,000 miles, new brakes & recaps, \$595. FP 8-2761.

TURNTABLE, hi-fi, Rek-O-Kut, model L34 & pickup arm w/Fairchild 225-A cart-ridge, \$45. PL 0-1936.

FOR SALE

TV, Zenith, 23", remote control, \$150. OR 8-0766.

ROLLER SKATES, Chicago Rink, men's, size 8, \$15. Box 1001.

FORD, 1958 9-pass. sedan, \$875; re-frigerator, Philco, 14 cu. ft., \$75. TW 3-9561.

PLYMOUTH, 1956, \$525. OR 0-6088 after 5 p.m.

WATER SKIS & tow rope, \$20. FR 7-2552.

CHEVROLET, 1953 convert., good top & tires, \$150. 378-1307.

COINS, 1960 Phila. B.U. pennies in tubes, \$1 a roll, Box 1002.

SHIP, complete working model of Hud-son's Half Moon, \$25; typewriter desk & swivel chair, \$25; 25' split cedar posts \$10; wristwatch, 21-jewel, man's Bulova, \$28; chicken pen, large, portable, wire. \$5. OS 6-5253.

DROPLEAF TABLE, antique, Lincoln, \$50; 2 parlor lamps, antiques, \$68 ea. PL 5-6301.

BICYCLE, boy's, 24", balloon tires, \$7; boat, 15' Fisherman w/cabin, Johnson 30 hp., \$475. 371-9730.

NASH, 1954 4-dr., \$100. NE 5-9944.

SKI BOAT, fiberglass w/trailer, skis, 25 hp Sea King elec., \$375. 671-8719.

VOLKSWAGEN, 1955, \$625. FR 5-8804.

CAR COOLER, Regal 12-volt, \$12.50; quart canning jars & lids, 75¢ a doz.; service porch sink, \$7.50. VE 7-4237.

CAMPER, cab-over-type, 7'x12', w/butane refrigerator & stove, sleeps 4, on a 1940 cab & chassis. \$400 or \$375 for camper only. DA 4-5824.

RUGS, Lee, 15'x15', rose beige wool, \$75; grey, 9'x12', wool, \$30; brown 9'x12' nylon, \$20. FR 4-2121.

TABLE SAW, Craftsman, 8", 3/4 hp. motor, portable stand w/table extens. & sepa-rate power grinder & disk sander unit, \$100; Corvette, 1958, 3-spd. trans., h/top, \$1950. FR 8-1674.

RAMBLER, 1960 Classic 4-dr, station wagon, std. trans., 6-cyl., htr., defroster, luagaae rack, \$1095. TE 3-4191.

SKI BOAT, 16' inboard & trailer, seats 6. Oldsmobile eng., recently o/hauled, extras, \$995. TE 5-2636.

PUPS, Toy Fox Terrier, 1 female, 2 male, \$25 ea.; parakeets, all colors, \$3-\$5 ea. DA 9-2106.

WASHER, automatic, \$30. 674-4037.

SOFAS, 2, 7', tuxedo-style, 5-mos-old, \$185; 6' Danish modern style w/center divider table, nauaahyde cushions, \$45 833-8238.

SURFBOARD, 9', \$80; motor scooter, \$50; bicycles, boy's, 3-spd., lite wt. racer, \$20; boy's, 26", hvy. duty, \$20; girl's, 16", \$7.50. PL 5-4497.

GUNS, Colt pistol, single action 22 cal. & holster, \$50; Savage 22 Maq-num over & .410 shotgun under w/case, \$40. 379-2734 after 5 p.m.

PLATFORM ROCKER, maple arms, green/brown tweed, \$20. 675-0521.

CORRESPONDENCE COURSE National School Radio-TV-Electronics w/lessons, tests, answers, multimeter, radio & ear-phones, \$60. DA 9-1865 after 4 p.m.

MURPHY BEDS, 4, \$25 ea. 384-9971.

WANTED TO BUY

METAL DETECTOR or schematic, must be modern. OS 5-2005 weekends & after 5 p.m.

PIANO, late model, any style or finish 378-6655.

BICYCLE, boy's, 26", reasonable & sturdy. FR 9-4517.

WOOD LATHE, OS 6-2803.

IAS JOURNALS, pre-1959 & ARS Jour-nals (pre-1962). 675-5457.

FOR TRADE

CABIN SLOOP, 24', trade for Corvair Monza, late model. FR 5-5490.

CHEVROLET, 1953, 1/2-ton pickup, will trade for station wagon of equal value. FA 8-5365.

FREE (to be given away)

KITTENS, 1-5. DA 7-9934.

PUP, half cocker, half poodle, female, black, 4-mos-old. 377-1922.

RENTALS OFFERED

MOUNTAIN CABIN, 4-bdrm., 1 1/2 baths, furn., 3 miles from Lake Arrowhead Village, for vacationers June-Sept., \$65 week or \$200 mo. DA 4-5774 evenings.

APT., new custom furn., carpeting, drapes, built-in range & oven, disposal, sliding glass door to private patio, pool, in foothills of Rollins Hills Estates near Crenshaw & 101, adults. 1-bdrm., \$120 mo. 326-0474.

CABIN, Green Valley Lake, \$50 wk. DA 4-5961.

MOUNTAIN CABIN, sleeps 6, 2 baths, near Crestline, June-Sept., \$60 wk. EX 1-2040 after 4:30 p.m.

APT., bachelor-type, 2 blocks from ocean in Manhattan, furn., utilities pd., weekly maid service can be arranged, \$85 FR 4-8757.

APT., 1-bdrm. w/qarb. disp. & garage, 133rd & Prairie, \$75 mo. FR 7-4926.

Ice Skating—Newest NRC Leisure Fun

The Northrop Recreation Club, Fred Armstrong, president, announces a new activity—ice skating. Meetings are scheduled for Monday nights from 7 p.m. beginning on June 10.

This new leisure pastime will be held at the Olympic Ice Arena, 23770 South Western Avenue, Torrance.

Emphasis is on family participation.

Reduced prices are in effect providing ID card or Norair badge is shown at the arena when tickets are purchased. Prices, which include skates, are up to 11 years, 75 cents, ages 12 to 17, 85 cents and grownups, 18 and over, 95 cents. These same prices regularly are \$1, \$1.20, and \$1.35.

There will be free hot chocolate and coffee compliments of the Northrop Recreation Club. A figure skating exhibition and organist Jim Roberts will provide extra entertainment.

AT&SF TELLS OF BARGAINS IN VACATION TOURS

Timely advice to vacation planners—

Morris H. Wright, local AT&SF passenger agent, cautions that all who are planning a railway trip during the summer months, should make reservations now, if possible.

Same advice applies to all modes of transportation; air, land or water.

If it is the Santa Fe you are traveling on this summer, arrangements can be made at Santa Fe Railway's Inglewood ticket office. Telephone number is OR 7-1272.

Mr. Wright suggests that Northrop people identify themselves as working at Norair, should they make Santa Fe reservations. This won't hurt and it certainly might help.

They have a "go now—pay later plan."

They have "Economy Family Plan" fares, honored for departure Monday, Tuesday, Wednesday, or Thursday, return any day.

NEW NRC DANCE SERIES ON "TAP"

A new series of NRC dance classes have been announced by Hank Solak, Norair Dance Club commissioner.

Priced at \$10 a person for each 10-week class, lessons in the cha cha, western swing, mambo, and samba will be taught.

The first class, cha cha and western swing is from 7 to 8:30 p.m. The second class, western swing and mambo, 7:45 to 9:30 p.m. The third class, mambo and samba, 8:45 to 10:30 p.m.

Classes will start June 13 at the NRC Clubhouse, 12917 Cerrise Avenue, Hawthorne.

FOUND

CONTACT LENS for left eye. Lost & Found, ext. 1972.

FOR SALE OR TRADE

MG, TD, 1953, new tires, interior, clutch, \$400 or trade for good running car. 672-7042.

PALM TREES, 2, 12' Yucca, \$15 ea.; 1 3' Yucca, \$3 or trade for cement mixer, 378-5348.

In the High Sierras



SNOW—The NRC Ski Club faces a Mammoth Mountain blizzard for the photographer during a recent trip to that High Sierra spa. From left are Don Moore, Carol Stahr, Jim Stark, Maureen Locken, Gary and Darlene Thompson, Ronnie Gregg, George Kern, Ski Club commissioner, Paul Mason, and Sally Iverson. The next trip up the mountain will be June 15 and 16. Next Ski Club regular meeting will be June 19.

ANNUAL ROARING '20s BALL SET FOR JUNE 22

The long-awaited NRC third annual presentation of the Roaring '20s Ball is set for Saturday, June 22.

Location is the Mayflower Ballroom at 234 South Hindry in Inglewood.

Admission is \$2 for each person.

The Roaring '20s Ball each year has been voted an absolute must for the following year and this one promises to be no less an attraction.

Leon Guide and his orchestra, plus the Mayflower Quartet, will

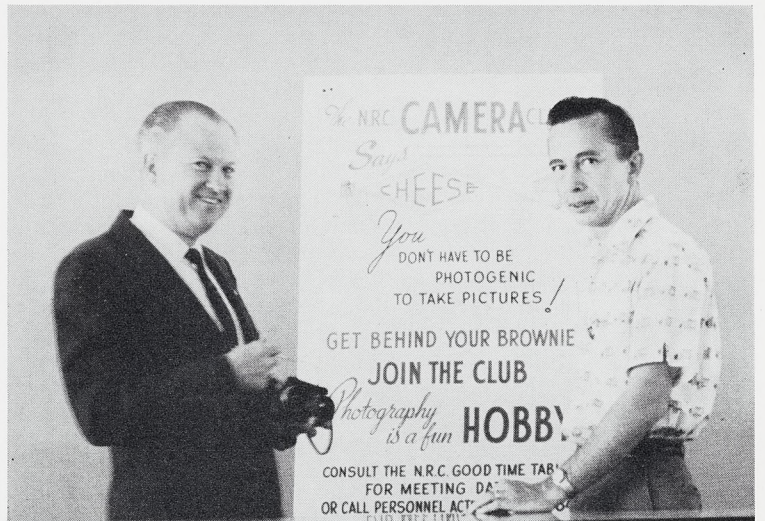
furnish music continuously between hours 8:30 to 1:30.

Hilarious headliner of the affair will be the session of time out from festivities to award the "best dressed" costume prize and other surprises ingeniously planned by the Club.

Dress is optional, as you were during the Roaring '20s, or casual, ala the 1960's.

Tickets are limited to the first 600 persons. Word to the wise is hurry up and make your reservations.

NRC Cafeteria Feature



NRC FEATURE—The Northrop Recreation Club exhibits, being regularly displayed in the Plant One cafeteria, are proving of exceptional interest value, it is reported by Fred Armstrong, president, here at left with Thurman Sharpe, Camera Club commissioner, in photo taken of recent shutterbug effort. Travel Club is being featured currently. For those who would like to join the Camera Club, meetings are held on the fourth Tuesday of each month at Lester Lauck's Hobby Room, 17234 Eastwood Avenue, Torrance. Their annual competition takes place on June 25. Personnel Activities has all the details.

NORTHROP NORAIR NEWS

Issued biweekly by Norair Division of Northrop Corporation

• Wednesday, June 19, 1963

HAWTHORNE, EDWARDS AFB, PALMDALE

SAN ANTONIO, EL PASO

WESTERN UNION TELEGRAM

MR. THOMAS V. JONES, PRESIDENT
NORTHROP CORPORATION

I WAS DELIGHTED TO RECEIVE THE REPORT THAT 99.68 PER CENT OF THE EMPLOYEES OF NORTHROP CORPORATION ARE PARTICIPATING IN THE PAY-ROLL SAVINGS PLAN. THIS IS A SPLENDID ACHIEVEMENT. YOU HAVE SET A FINE EXAMPLE NOT ONLY FOR THE COMPANIES IN YOUR OWN AEROSPACE INDUSTRY BUT FOR ALL AMERICAN INDUSTRY AS WELL. PLEASE EXTEND WARM THANKS AND CONGRATULATIONS TO ALL WHO HAVE HELPED MAKE THIS RECORD POSSIBLE.

DOUGLAS DILLON,
SECRETARY OF THE TREASURY,
WASHINGTON, D.C.

Gun Nose Ups Firepower For Northrop F-5 Jet

The Northrop F-5 supersonic fighter, scheduled for deployment overseas under the U.S. Military Assistance Program, will be equipped with two rapid-firing 20 millimeter cannons in its nose.

The 3000-rounds-per-minute rate of fire of the cannons will augment the F-5's striking power for the air-to-ground attack role, as well as close-range air-to-air combat.

The cannons can be replaced if desired by two 45-gallon fuel tanks. All other armament and stores are carried on the wing-

(See photo, Page 5)

tips and on five pylons underneath the wings and fuselage.

The entire gun installation can be easily removed from the F-5 for checkout or for replacement with extra fuel tanks. In addition, a camera nose forward of the gun installation can be used in conjunction with either the cannon or extra fuel tanks.

The F-5 is a multi-purpose, twin turbojet, supersonic fighter chosen by the Department of Defense for fighter aircraft replacement in selected allied nations under the Military Assistance

Program. It is intended for close support of troops, interception of enemy aircraft, attacks on communications and supply lines and armed reconnaissance missions over enemy territory.

BRING THINGS FOR MARINERS RUMMAGE SALE

Next week, June 24 to June 28, the NRC Girl Scout Mariners Ship 262-S, asks that Northrop people bring their castoffs and unwanted to the plant to help out in the young ladies' rummage sale.

The girls will park rummage trailers at Gates 3 and 5 and they will be on hand in relay teams to help out in any way possible as Division personnel bring in salvage material.

Anything and everything that can be resold is needed. The proceeds will help allay expenses for their camping program.

Newsreaders will recall the delightful stories written by two of the girls about their trip down the Colorado River.

Suggested items: old clothes.
(Continued on Page 6)

FREE NRC SWIMMING AT LEUZINGER FOR SUMMER

That time is here again—!

In case anyone isn't aware, July 1 is just around the corner which means that the NRC has once again arranged for a summer of free swimming at Leuzinger High School's outdoor pool.

Fred Armstrong, NRC president, issues a call for all Norair personnel to come on in, the water is fine.

Mondays, Tuesdays, Wednesdays and Thursdays will be Norair exclusive for the two-hour period from 4:45 to 6:45 p.m.

Leuzinger High School is on Rosecrans between Prairie and Hawthorne Boulevards.

The pool will be open con-

tinuously all during the summer with the exception of July 4.

Bathing caps for women are required. Also bring your own towel. A lifeguard will always be in attendance, says Fred.

"Tell everyone," he says, "so that none will miss this summer fun."

Last Call
Roaring '20s Ball
Saturday, June 22
Tickets at Personnel
Activities

Flight Plan for Lindbergh Route



THEY FOLLOWED THE LINDBERGH ROUTE—Four Randolph AFB Talon Task Force pilots who flew two supersonic T-38s to the Paris Aeronautical Salon are from left, Majors Jimmy Nichols and George Holt and Captains James Light, Jr. and James Daniel.

TRANSATLANTIC FLIGHT FOR T-38s IN PARIS AIR SHOW HOP

Randolph Air Force Base—Two Randolph Air Force Base T-38s were flown to Paris, France, successfully completing the first transatlantic flight ever attempted by the supersonic trainers. Purpose of the flight was to take part in the Paris Aeronautical Salon, a world-renowned air show, June 6 to 16 at Le Bourget airport just outside the city.

The T-38s, piloted by Flight Commander Major Jimmy L. Nichols, New Baden, Texas; Major George W. Holt, Mount Rainier, Maryland; Captain James E. Light, Lansing, Michigan; Captain James E. Daniel, Chattanooga, Tennessee, took off from here last week and made refueling stops at Langley AFB, Virginia; Loring AFB, Maine;

Labrador, Iceland and Scotland.

Maintenance men and equipment followed same route in a C-124 cargo aircraft to support the flight. The men, all members of the 3510 Flying Training Wing are, SSgt. O. L. Aubry, San Antonio, Texas; SSgt. Raymond Eachus, Covington, Kentucky; SSgt. Rutus C. Hartzog, Panama City, Florida; SSgt. Milton H. Jones, Honea Path, South Carolina; A1C Billy W. Churchwell, Taylorsville, Mississippi; A1C Harry E. Drevs, Kerrville, Texas; and A2C Alfred Montemayor, Edgewood, Texas.

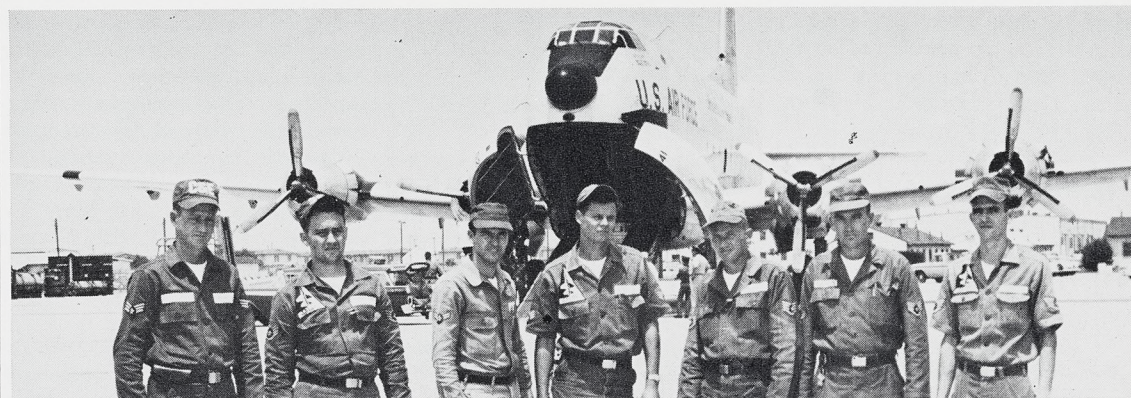
The flight will go into the record as the latest of a series of transatlantic flights originally pioneered successfully by the "Lone Eagle" Charles A. Lind-

bergh, just 36 years ago—May 21, 1927. The flight varied in many respects from Lindbergh's, however.

He completed the non-stop flight of 3600 miles, alone, at 107.5 mph in 33.5 hours. The Randolph aircraft covered 4125 miles of the overseas portion at an average speed of 550 mph in 7½ hours. While Lindbergh flew at just above sea level, the T-38s' flight was made at 40,000 feet.

The flight for the Air Training Command pilots was a multi-command operation. They were briefed by pilots of the 4440th Air Delivery Group (Tactical Air Command) and en route received support from Strategic Air Command, the Military Air Trans-

(Continued on Page 5)



GROUND CREW FOR THE PARIS FLIGHT—Ground crew for the two aircraft sent to Paris are, left to right, A1C Billy W. Churchwell, SSgt. O. L. Aubry, A2C Alfred Montemayor, A1C Harry Drevs, SSgt. Rutus Hartzog, SSgt. Raymond Eachus, SSgt. Milton H. Jones.

Norair's Operation Safety

Beryllium, a space age exotic used as a neutron source in atomic engine installations, used also as an extremely light high-melting point metal in structural applications, is gentle as a kitten under normal circumstances. Fact, beryl, a beryllium compound, can be that brilliant green jewel milady often wears. The emerald.

But mix a little beryllium in the air you breathe, and you've got problems, toxic ones. "Threshold Limit Values for 1962," published by the American Conference of Government Industrial Hygienists, says that if you exceed 0.002 mg/m³ you've got health trouble.

Mg/m³ is milligrams per cubic meter of air; 0.002 of that would mean a speck weighing two and a half millionths of an ounce.

All this to illustrate and give

If beryllium is not an exotic of any health concern at Norair simply because we use small amounts of it, other substances we do use and environments we

By Aerospace Reporter

encounter, could without vigilance become hazardous. Safety Engineering, backed up by management and a 3-level system of safety committees, could very well add "preventive" to their name.

BEFORE, NOT AFTER

Says John Breneman, manager, night Operations, and chairman of the General Safety committee, "Vigilance is the Norair answer to hazard. Operation Safety means that we 'close the barn

assembly line nearly a quarter of a mile long, it helps Maintenance folk to be able to spot their fellow workers yonder.

Bump hat color scheme is:

White for foremen and utility men.

Yellow for electricians and electromechanics.

Red for plumbers and hydraulic workers.

Blue for mechanics, oilers and machinists.

Green for painters.

The list of Division-furnished safety equipment includes, to name a few; safety glasses, eye shields, aprons, gloves, boots, jackets, face masks, respirators, the aforementioned hard and bump hats, safety toe guards, shoe covers, earplugs and ear muffs.

All of the foregoing is the obvious part of safety. Not so well known is the vital business of controlling the physical environment in the plants.

ENVIRONMENT

Environment quite naturally starts with the basic establishment, the plant, the building and facilities. Here with the aid of Facilities Engineering, the multitudinous factors that make for safe work conditions are designed into new Norair structures as they are built and older buildings are constantly updated to meet minimum requirements for such things as a 6 to 1 safety margin for all spans that support hoists and carry weights, adequate aisle width, generous head clearances, proper stairway supports. Stair treads themselves have safety minima and maxima. For instance, slopes should be from 30 to 35 degrees. Tread width should be 9 1/2 inches with a 1-inch nosing. Tread heights should not exceed 8 inches and all steps should be uniform. A generally unnoticed but highly important safety factor is that all floors must be smooth and level.

Lights are critical. Safety authorities in the United States Department of Labor attribute inadequate lighting as the cause of 25 per cent of all industrial injuries.

Norair Safety Engineering in their process of measuring for correct amount of foot-candles available check five important points: (a) Too little light; (b) glare; (c) shadows; (d) too great a contrast; (e) variation and flicker. Foot-candle amounts generally agreed as acceptable at Norair: For fine detail with low contrast background, 100. At the other end of the scale, rough tasks not requiring critical seeing, 10 is adequate.

RIGHT LIGHT

Colors are important. Not only the use of which will identify an electrician or hydraulics man one hundred yards away as with the bump hat but colors used in the major plant painting scheme on buildings and equipment. Figures show that white surroundings have the greatest amount of paint reflection value at 88 per cent. Cream and sky blue are medium on the list with 67 and 65 per cent respectively. At the bottom, surprisingly, is aluminum, 41 per cent.

Of high level importance to Operation Safety is the system of colors denoting safety hazards. Norair follows American safety color code Z53.1.

Red—for fire protection equipment, danger, flammables, and as

a stop signal.

Orange—dangerous parts of machines, other hazards.

Yellow—designates caution, physical hazards.

Green—safety, as with the green safety cross.

Blue—caution against starting or using equipment.

Purple—radiation hazards.

Black and white—traffic and housekeeping markings.

Once you have a safe facility you certainly must have safe equipment. It's Safety Engineering's job plus a duty high on the responsibility list of foremen and supervisors that all machines be properly guarded. Using the right tool for the right job is preventive safety. Likewise, operation and training in safe use of equipment. Also, good use of repair

mechanically rather than manually. Trained personnel with adequate supervision are always on the job.

There is strict adherence to the standards for heights of piles of material, operation of trucks and lifts, plus all other handling methods constantly under way in the factory.

Hazardous materials must ever play a part in the American industry. These fall generally in three categories; the corrosives, the toxics, and the flammables.

For corrosives Operation Safety preventive measures include:

1. Prevention of spillage and spitting.
2. Safe methods of handling.
3. Personal protective equipment and clothing.
4. Emergency provisions such

MR. LLOYD ON SAFETY

Bob Lloyd, vice-president and assistant general manager, Operations and a 21-year man states, "Safety is a part of doing business, an important part. It touches all of us, employees and management alike. It is an important element in achieving customer confidence. It is a good neighbor factor in building community good will."

"It is Northrop Norair policy that a vigorous program of safety engineering be in continuous effect. This, by management wish, goes beyond mere rule book compliance with codes and standards set up for American industry. We traditionally add our own concepts of human engineering, personnel welfare, and dignity of the individual. Also, long experience has taught us that safe work conditions and 24-hour environmental control are vital to good workmanship and quality products."

"A safe plant and facility and a clean shop are signs that say a prideful team works here."



PALMDALE IS A WINNER—Corporate Vice-president and Norair General Manager Dick Nolan congratulates Tom McCracken, Palmdale base administrator for winning first place, 1963, over other aerospace facilities in his class. Tom's boss, Jack Mannion, manager, Manufacturing, and a strong supporter of plant safety programs, is at right.

a feel for the precision responsibilities of Norair Operation Safety.

When you see plant safety engineers and hygienists, instruments in hand, moving slowly from area to area, studiously checking, making notes, consulting with shop and laboratory supervision, this is Operation Safety at work.

Beryllium, in spite of its high degree of toxicity, need give Norair people little pause. The metal used here in development has all been in laboratory-size specimens and has been worked under "reagent grade" conditions; machined under oil, in clean rooms with washed and filtered ventilation. Also, don't worry about that emerald, if you have one. It is a silicate Be₃Al₂(SiO₃)₆, and harmful only when you throw it as a stone or pebble, at somebody. Granite is made up mostly of silicates. Feldspar is a silicate.

Back to Operation Safety.

NORTHROP NORAIR NEWS

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PUBLICATION
NORAIR DIVISION

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CHARLES BRADFORD, Editor

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facilities all the way around.

Repair leads to the maintenance field. Greasing and oiling has to be done on a regular schedule. Books have to be kept on fatigue quotients. Exceeding the design strength of equipment is dangerous.

LIMIT SWITCHES

Norair has limit switches on all cranes and preventive maintenance provides cycle tests to assure that they conform to Norair standards for efficient and safe environment.

Men in factories must work with materials. This is another area of safety concern. Adequate storage must be provided for, and adequate aisle width for safe transportation; plus correct flow charts and processes to prevent mixtures and contamination of aerospace materials and supplies. Wherever possible, Norair sees to it that materials are handled

as deluge showers, eye baths, respiratory protective equipment.

The toxics, particularly in recent years as the aerospace state-of-the-art progresses, find Safety Engineering and Safety committees performing watchdog services over their use.

The management of hazardous materials is a serious business. Whenever a new member of the exotic family is needed in research and development or in manufacture, its behavior is thoroughly studied. Experts in its "care and feeding" are brought in to advise and assist. Executive bulletins and Standard Practice Procedures go out to all personnel, even those remotely concerned. Generally there are eight control measures for toxics, depending on conditions, that Operation Safety lives by:

1. Substitution of less toxic
- (Continued on Page 3)



"OSCARS" FOR SAFETY—Northrop Norair Division was thrice honored at the recent 14th annual Business and Industry Safety Awards dinner. "Perfect record" plaques for the past year were presented to Palmdale facility, Edwards Air Force Base facility, and Mariposa. Being congratulated by George C. Sopp, vice-president, Industrial Safety, Greater Los Angeles National Safety Council, second left, are William Larrabee, Corporate vice-president, Legal; John Breneman, director, night Operations; Lee Johnson, chief safety engineer.



GENERAL SAFETY COMMITTEE—There are two other committees, Foremen and Workmen. Meetings are held once each month. Membership here is on superintendent and staff levels. Chairman is Mr. Breneman, seated at head of table. From left, standing, Chuck Beuchat, Bill Minner, Rex Thornhill, Larry Pieper, Dale Steen, Claire Ray, guest; Dick Brown, NSL; Ron Metro,

guest; Bill McKindley, W. V. Bogart, Bud Kinsey, Red Howorth, Roy Prueter, Earl Nickles, and Dr. Richard Krebsbach. Seated (L-R) Tom Chittenden, Bill Parker, Roy Balling, Jim Quick, Mr. Johnson, Mr. Breneman, George Putnam, safety engineer; and Ed Bates. All chairmen are automatically members of the other two committees. Each separate facility has duplicate committees.

(Continued from Page 2)

materials wherever possible.

2. Enclosure of harmful processes.

3. Isolation of harmful processes.

4. Local exhaust ventilation.

5. General ventilation.

6. Use of wet method.

7. Use of personal protective devices.

8. Decreased daily exposure of workers.

Building supersonic trainers, building parts for passenger jet airplanes that can fly nonstop from Washington to Moscow at 30,000 feet, working on lunar and interplanetary systems, by the very nature of the technology

requires the taming and use of toxically hazardous materials.

Tolylene-2, 4-diisocyanate, vital to fungus control in wing structures, must always be held to a health threshold limit of 0.02 parts per million; parts per million being defined as parts of vapor or gas per million parts of air by volume at normal temperatures.

Cyanide and its compounds are poisonous as everyone knows. This being the reason they are so effective against fungus which is just as dangerous if allowed to accumulate in fuel tanks.

And a substance doesn't have to be exotic to be dangerous.

Man's oldest chemical friends

can hurt you. Such mundane things as mercury, lead, and gasoline have their limits. Five hundred parts per million is the ppm limit for gasoline. Lead is 0.2 milligrams per cubic meter. Mercury is 0.1.

Flammables:

Flammable materials and strong oxidizers always present the problem of fire and explosion. Vapors of some solvents in addition to being toxic are a fire hazard. Preventive methods against fire as employed by Norair Operation Safety are based on the idea of keeping concentrations of vapors well under the lower limits at which they will burn. If these lower limits are too high with respect to worker's health, toxic techniques take over and concentrations are brought within the health-safe thresholds.

Operation Safety has found that preventive measures as recommended by the American Conference of Governmental Industrial Hygienists do very well in dealing with and controlling the toxic tigers of industry; clean rooms, respirators, ventilation, water washing, oil washing, to name a few.

WALK TODAY

Instruments, wonderfully sensitive, enable us to walk today where even "angels feared to tread" a half century ago.

The list of precision instruments necessary in a modern safety monitoring program has grown with the industry. At Norair no expense is spared to make sure that our surroundings are wholesome and healthy. Too much is at stake in performing our jobs in the nation's defense effort to accept anything less.

States Mr. Johnson, "The carefully planned program of safety at Norair has won for the Division an outstanding record in industry. The Division has been awarded 42 safety awards for having the lowest accident frequency rate in all industry, plus 6 safety achievement awards from U.S. Department of Labor. Fifteen awards from Greater Los Angeles Chapter of Safety Council. Fifteen from the National Safety Council.

"The pedestrians of our community can also take comfort from the Northrop Norair safety outlook. The Division's motor transport section has won the National Safety Council sweepstakes award for the safest fleet in Southern California. The fleet has earned many additional safe driving awards."

For photos of Operation Safety in action, see pictorial next page.

Aerospace Safe Monitoring Is a Precision Business

Instruments used at Norair in Operation Safety monitoring:

* * *

Dust Vue Microprojector, CT 45823, Mine Safety Appliances Company, for dust count.

* * *

Anemometer, 3132, Taylor Instrument Companies, for measurement of airflow speed—feet per minute.

* * *

Sightmeter, 703, Weston Electric Instrument Corporation, for illumination intensity—foot-candles.

* * *

Pyrometer, Marsh Instrument Company, temperature—ovens, et cetera.

* * *

Frigidaire leak detector, gas, nonflammable.

* * *

Ultra-violet meter, J220, Ultra-Violet Products Company, intensity of ultra-violet light.

* * *

Carbon monoxide tester, DS-47133, Mine Safety Appliances Company, per cent of carbon monoxide.

* * *

TDI reagent kit, Union Industrial Equipment Corporation, tolylene diisocyanate measurement.

* * *

Constant rate air sampler, Uni-Jet, Union Industrial Equipment Corporation, collects dust, gases, fumes.

* * *

Precision gas detector—Kitagawa, Unico #400, Union Industrial Equipment Corporation, by colorimetric method.

* * *

Mercury vapor meter, 21, Harold Kruger Instruments, mercury in air by photometric method.

Universal testing kit, 83500, Mine Safety Appliances Company, contaminants in air by colorimetric method.

* * *

Spring balance, Chatillon's, pounds—push or pull.

* * *

Combustible gas indicator, 40, Mine Safety Appliances Company, combustible gases—explosive limit.

* * *

Gascope indicator, 53, Mine Safety Appliances Company, natural gas.

* * *

Explosimeter, 2, Mine Safety Appliances Company, combustible gases.

* * *

Oxygen analyzer, D, Arnold O. Beckman, oxygen.

* * *

Ventilation smoke tube and aspirator bulb, BH-5645 and BH-5607, Mine Safety Appliances Company, direction and velocity of air currents.

* * *

Sound Scope analyzer, B, Mine Safety Appliances Company, analysis of noise in decibels.

* * *

Sound-Survey meter, 1555-A, General Radio Company, measures noise in decibels.

* * *

Alnor Velometer, Illinois Testing Laboratories, velocity of air in booths and ducts.

* * *

Sling psychrometer, Taylor Instrument Companies, records humidity and comfort zone.

* * *

Survey Meter Redector, AGB-500B-SR, Victoreen Instrument Company, ionizing radiation.

* * *

Microscope, STA, Bausch & Lomb, Inc., dust count.

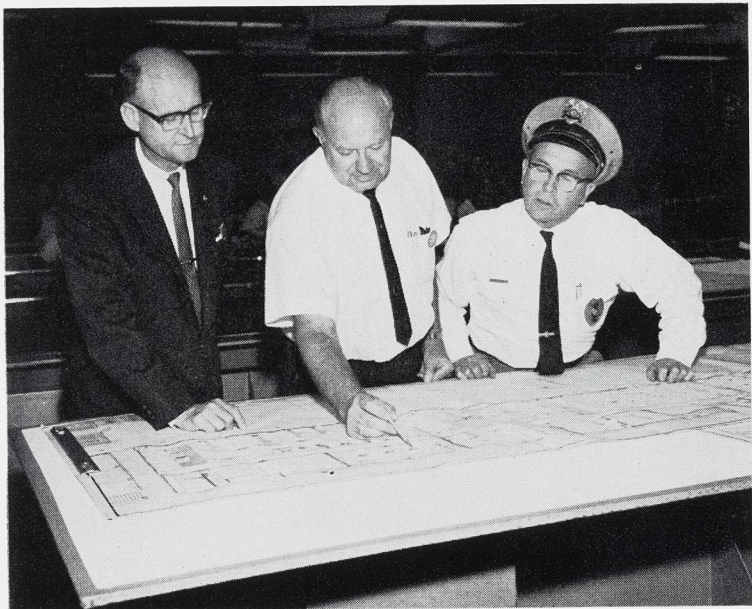


STARTS WITH THE BASICS—Norair Vice-president and Assistant General Manager, Operations, Bob Lloyd, center, confers with Ole Omley, director, Production Operations, and Mr. Breneman on Operation Safety features on the new T-38/F-5 assembly lines. Note generous aisle width, note also, normal height working positions on forward fuselage and final lines. Note high foot-candle lighting provisions. Note clean-sweep cleanliness. States Mr. Lloyd, "A safe plant and facility and a clean shop are signs that say, 'A prideful team works here'."

Safety Pictorial

More Photos on Page 4

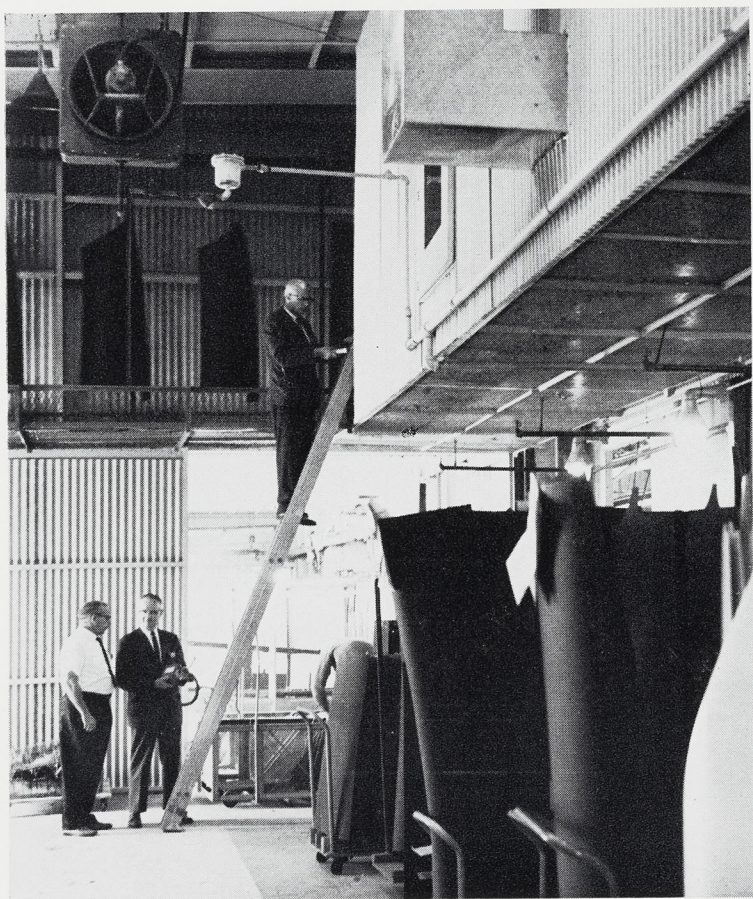
PPM ☆ Riding Herd On Our Environment ☆ mg/m³



OPERATION SAFETY—Safety starts with the basic establishment. Here, Mr. Johnson, left, and Fire Prevention Inspector Fred Cutler, right, check blueprints for new structure with Facilities Engineer Steve Lopuch. Operation Safety program is continuously in effect. Its influence even extends to customer and community relationships.



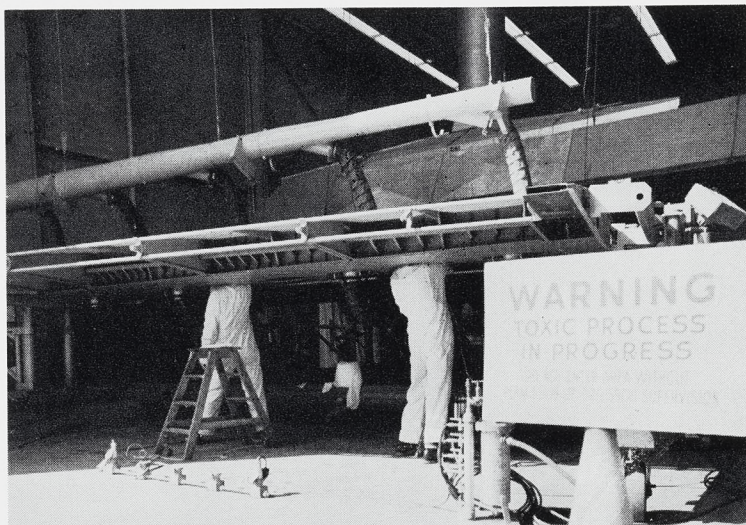
LIGHT RIGHT—Foot-candles available to Pauline Quast, Chem-Mill, as she does delicate job of scribing maskant from parts prior to the "bite", are determined by Mr. Putnam. Light must be just right, not too much, not too little. It must not flicker and must not cast shadows.



CHEM-MILL PRODUCTS — View is in Norair's maskant coating room of Chem-Mill building. Parts that have been coated with maskant thinned with toluene thinner travel on conveyor and pass through drying oven. Mr. Putnam is on ladder using Kitagawa precision gas detector to measure concentration of toluene in air to assure that ventilation system is working properly. Barney Elliott, foreman, discusses use of Velometer for measuring drafts with Al Noyes, Norair industrial hygienist. Toluene has threshold of 200 ppm, 750 mg/m³.

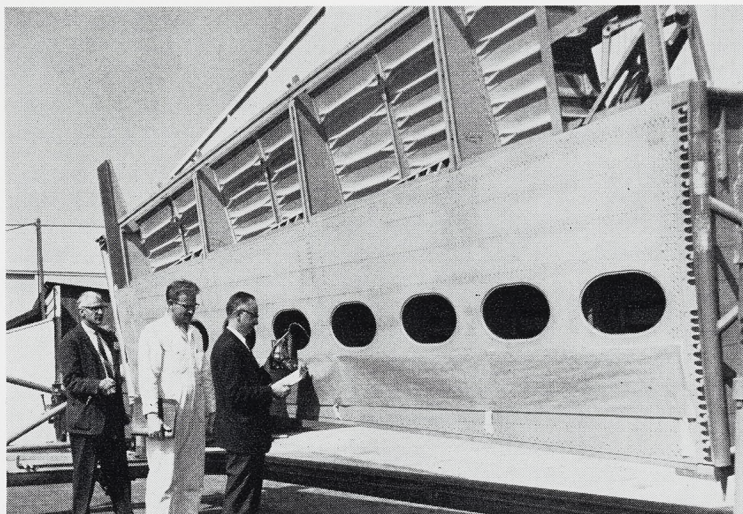
FUNGUS FIGHTERS — Here men in Process, Paint and Upholstery, apply the all-important sealant and fungus killer, tolylene diisocyanate. Note exhaust system that captures toxic fumes.

— This substance has safety threshold of 0.02 ppm. It cures rapidly, becomes inert and does the fuel protecting job as no other preparation can, helping to whizz jet airline passengers around the world without a worry. Large warning signs are part of Operation Safety.



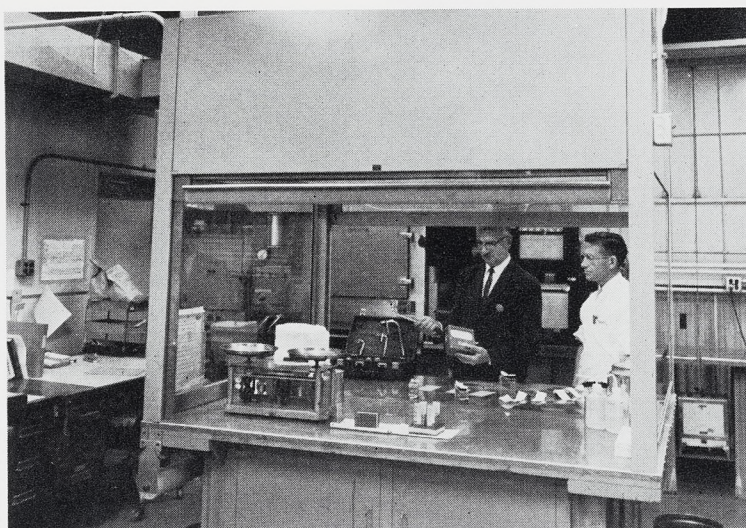
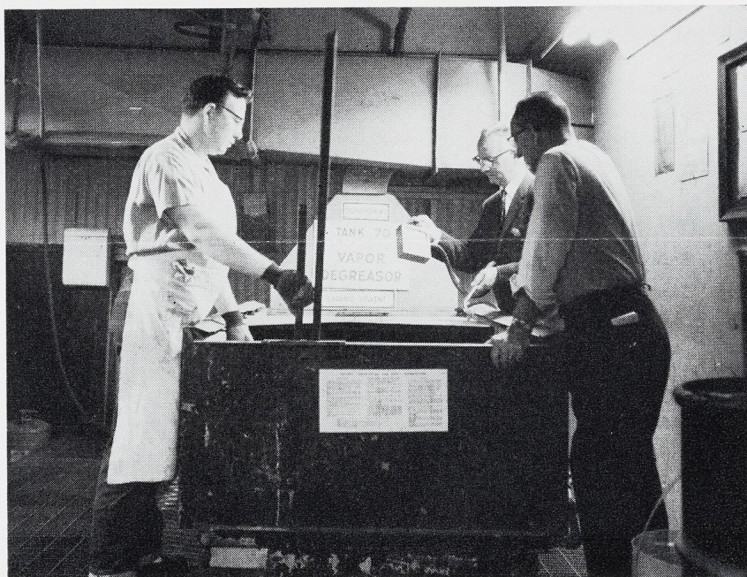
PROPERLY CURED — View outside Paint and Seal Building showing wing, the interior of which has been coated with tolylene diisocyanate anti-fungus coating material and cured with forced-air system. Mr. Noyes, at right, operating "Uni-Jet" constant rate air

sampler, which collects air sample; is observed by "Red" Glen Jennings, Process, Paint and Upholstery. Mr. Putnam, at left, operates sling psychrometer to determine air temperature and relative humidity.



ONE HUNDRED PPM — Check is being made to make sure that trichloroethylene solvent, an important space age cleaner of parts, comes well below the threshold limit of 100 ppm. Operation is vapor degreaser in Metal Fitting and Weld Shop. Operator at

left is Paul Bunn. Pat Garrett, foreman, is right foreground. Mr. Noyes, at rear, gets ventilation reading. Note main air exhaust duct on wall. Foreign matter, potentially toxic and otherwise, is removed from air by washing and filtering.

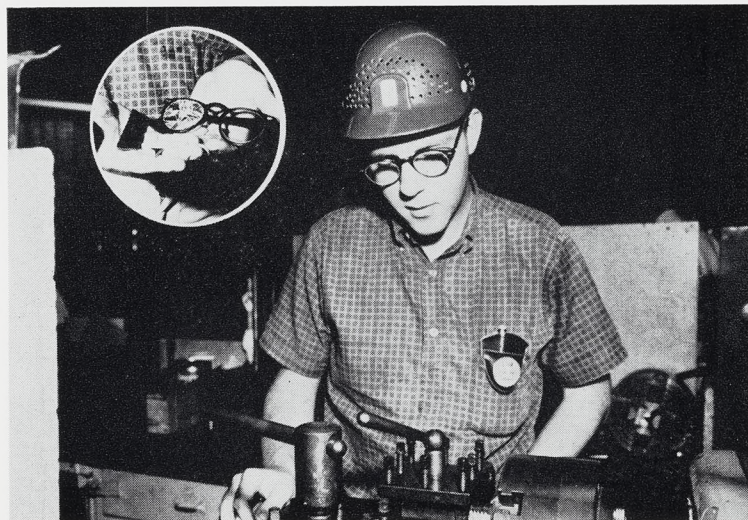


FOR QUALITY CONTROL — Velometer comes into use as Mr. Noyes gets readings to determine if vent system is adequate within glassed-

in Quality Control laboratory booth. Bob Lawrence, 7620, also observes reading. Booth is used when applying toxic coatings to aerospace test specimens.

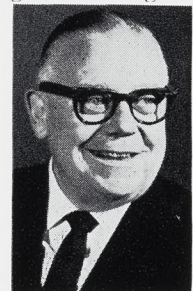
WISE OWL CANDIDATE — Lawrence Conzen, Maintenance Machine shop, has reason to thank Operation Safety by virtue of having escaped eye injury. Rule that all Norair people in shop areas wear safety

glasses has brought membership in the Wise Owl Club to 65 persons. Safety glasses plus many other items of protective equipment are available free of charge in Division tool stores.



Mr. Johnson Talks On Friendship

Chuck Johnson of Organization 1231, Security group, says "friendship" is one of Northrop's greatest fringe benefits. In my column of April 24 I requested that you write me naming what, in your opinion, is Northrop's greatest fringe benefit. I am very grateful for the many replies to this request.



In my mail a few days ago came a rather remarkable letter from Charles Johnson who feels that the friendship existing between the personnel and management at Northrop is our greatest fringe benefit.

Chuck's letter is so good that I am not going to attempt to quote from it but, rather, invite all my readers to peruse in its entirety. He had this to say:

"Dear Mr. Clark:

"Your article in the April 24 edition of the Northrop Norair News stated that in the near term you would be discussing

By John B. Clark

Northrop's greatest fringe benefit and you asked for comments.

"I have never before written to anyone concerning such matters, however, on this subject I have definite feelings which I believe would be of interest to you.

"I am a fairly new employee, having joined Northrop only two years ago upon my retirement from the Air Force. Accepting employment in industry after having a steady job with the Air Force for 20 years presented many challenges and required considerable adjustment on my part to adapt myself to civilian life and the ways of industry. This could have been a most difficult and trying time, yet at Northrop it was made easy by the commodity I consider to be Northrop's greatest fringe benefit.

"Before I discuss this benefit, we must define fringe benefit. Most individuals consider fringe benefits to be in the form of material or monetary value. Webster defines fringe as outer edge, border or margin; and benefit as a kindly, charitable act, anything contributing to an improvement in condition, and to do good to or for. Therefore, a fringe benefit is not in reality something of a material or monetary nature. We each have our opinion in this matter and most people may not agree with mine. I personally feel that Northrop's greatest fringe benefit is "friendship" which Webster defines as friendly feeling or attitude.

"This can best be described in the feeling and attitude I received as I was processed by the Personnel group on my first day at Northrop; also from my co-workers and supervisors during my probationary period; and from personnel throughout the Division during the performance of my job; and the feeling and attitude which is here present today.

"On my first day I was nerv-

ous and concerned, wondering what civilian life would be like. Would I be able to adapt to the way of industry? How would I be treated as a new employee? However, I was put at ease by the friendly and helpful attitude of the people in the Personnel group. During the processing I was treated with respect and friendliness, which gave me a feeling that I was part of Northrop and they were happy to have me join them. This first impression was certainly to become a lasting one with me.

"As I progressed on the job, my co-workers and supervisors were most helpful by the friendly attitude they displayed while teaching me the ways of Northrop. The learning processes were difficult; my old habits, attitude and personality had to meet with changes. Surely, I thought, they will lose patience and I will have failed to adapt. Yet, during those trying months the same friendly attitude prevailed, thus making me realize what was meant by the term 'Northrop is a good place to work.' Within this office a feeling of belonging existed, for each day there was always a friendly greeting, cheerful comments, or cards on birthdays and special occasions, and when trouble or help was needed someone was always available and ready to assist.

"In doing my job it was necessary to visit all areas of the Division and to come in contact with personnel of all categories. During these visits it was of great personal satisfaction to be received in a friendly manner by all and in most instances to be greeted by my first name. As you walk through the Division you begin to have a feeling of belonging and a realization that you are a part of the Northrop family.

"It is a wonderful feeling when you escort visitors, both from industry and government, through the Division and have them comment upon the attitude of personnel. A good example of this was last year when I had the occasion to escort a member of the State Department through. Each person with whom he came in contact had a friendly greeting and a cooperative attitude. This individual was so impressed that he spent considerable time upon completion of his business commenting upon the feeling of friendliness he received from all personnel.

"As I look over these past two years and review all that has taken place in connection with my employment, it is apparent to me that this friendly attitude of all personnel has greatly assisted me in starting a new career, adapting myself to the ways of industry, and in making me feel as if I am truly a part of Northrop. Therefore, it is my personal opinion that Northrop's greatest fringe benefit is friendship."

Thank you, Mr. Johnson. We are pleased that you have found us a friendly lot.

As indicated previously I have my own selection of Northrop's greatest fringe benefit which will appear as the subject of my column within the next few weeks.

FAMILY DAY IN BLUEPRINT STAGE, RECORD CROWD DUE



TENTATIVE DATE—July 14 is tentative date set for Northrop Norair family day. Here, planning committee meets to map details for tours and product demonstrations. Committee co-chairmen are John Breneman, manager, night Operations, and Paul Wierk, director, Technical Administration. Standing, from left, are Harry Graves, Research Laboratories; Freddy Wolfe, Cafeteria; Dave Nuffer, Public Relations; Charles Bradford, Northrop Norair News; Pat Doherty, Production Operations; Charley Eyres, Technical; Mike Sulentic, Facilities Engineering; Mr. Breneman; Lee Johnson, Plant Protection and Safety; Dr. Richard Krebsbach, Medical. Seated, from left, R. G. Van Allen, Finance; Roy Balling, Insurance; Ed Laski, Management Club; Mac McLarney, Transportation; E. A. Griefnow, Plant Protection and Safety; John B. Clark, director, Industrial Relations; Roy Prueter and Bill Minner (hidden), Manufacturing; Harry Clark, Nortronics; Don Kohler, Personnel Activities; Marvin Beyrodt, Industrial Relations; Dick Pryor, Personnel Activities; and Rip Godfrey, office of manager of Administration. Over 15,000 visitors are expected. Complete details in the next issue of the News—July 3.



CO-CHAIRMAN — Paul Wierk, director, Technical Administration, co-chairman with Mr. Breneman, for Northrop Family Day.

Transatlantic

(Continued from Page 1)

port Service and finally the U.S. Air Force in Europe.

The twin-engine T-38 became the first supersonic pilot trainer in 1961. It is now ATC's principal advanced pilot training aircraft.

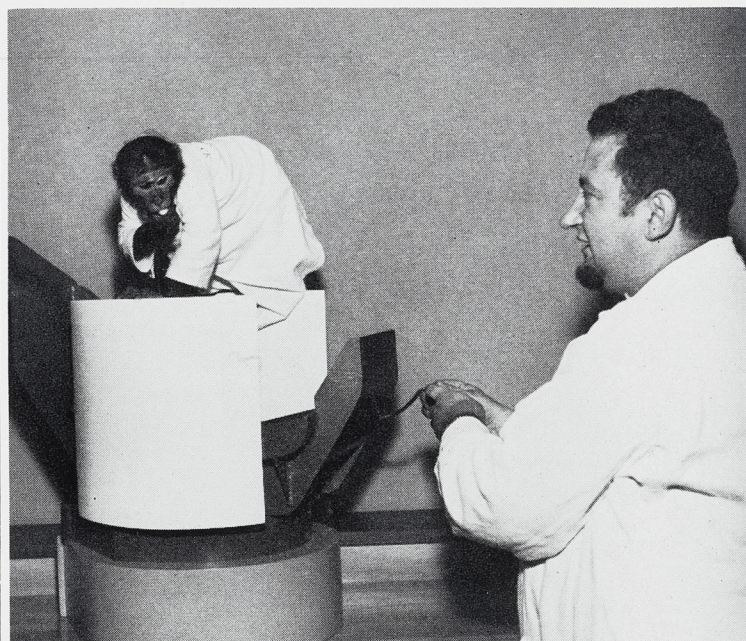
Al Eldridge is Norair tech rep at Randolph AFB.

Gun Nose

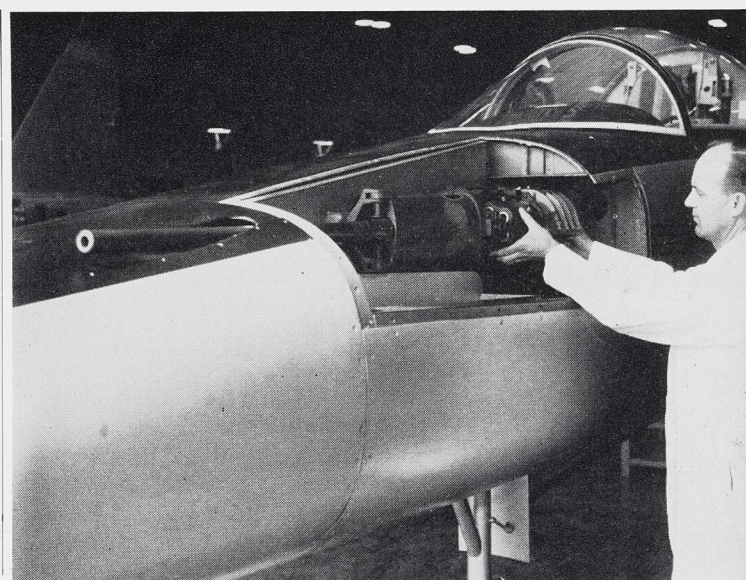
MORE FIREPOWER—One of twin M39 20mm cannons to be installed in the F-5A jet fighter is shown in this full-scale mockup of the plane's nose. The versatile, rapid-firing 20mm cannon will be a part of the F-5A

from the fifth production aircraft on. The two guns can fire at a rate of 3000 rounds-per-minute. Addition of the aerial cannon gives an added strike capability to the F-5A which can carry nearly half its weight, or 6200 pounds, in external armament.

Banana Power



JOE-JOE THE SCIENTIST HELPS—A pet monkey of the California Caviary was loaned recently to the Life Sciences section of NSL for measurements regarding design of man and primate support-restraint systems. Many bananas planted at the bottom of the white feeder reservoir mock-up, plus the leash held by Dr. Walter Kuehnegger, helped Joe-Joe, a *Macaca nemestrina andamensis* 6-pounder, through the design checkout.





RIDES WANTED

7 a.m. — 3:45 p.m.

ARTESIA & McKAY, Redondo Beach. Kathleen Plumb, ext. 4287, 4288. 2

7:30 a.m. — 4:15 p.m.

PRAIRIE & LENNOX BLVD., Lennox. Judy Martin, ext. 1421. 3

PARKER ST. & PASEO DEL MAR, San Pedro. William Lurie, ext. 2041, TE 3-2512. 3

DEL AMO & PARAMOUNT BLVD., Lakewood. Henry Dreher, ext. 530, ME 3-0082. 3

8 a.m. — 4:45 p.m.

LA BREA & MANCHESTER, Inglewood. Jeanne McClintock, ext. 1383, 674-3953. 5

NORMANDIE & REDONDO BEACH, Gardena. Bernice Oddy, ext. 2151, 329-6266. 5

CHAPMAN & EUCLID, Garden Grove. Jerry M. Evans, ext. 1338, JE 4-3369. 5

RIDES OFFERED

7 a.m. — 3:45 p.m.

ARTESIA & McKAY, Redondo Beach. Kathleen Plumb, ext. 4287, 4288. 12

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BBSF Classified Ads

BBSF classified ad service is provided free of charge to all Northrop Norair personnel.

Ads for agencies, commercial enterprises and private businesses are not accepted.

Deadline is noon Wednesday, one week before publication.

FOR SALE

RAMBLER, 1960 6-cyl, 6 series custom, 4-dr., 6-pass, wagon, repo., \$290 down, \$1271. Credit Union, Ext. 617. A

HOUSE, in Anaheim, by owner—modern 3-bdrm., 2 bath, family room, kitchen all built-ins incl. refrigerator, near freeways, new schools & shopping centers, patio, fenced & landscaped, soft water installed, redecorated, carpets, drapes, new slate entry & hearth, \$21,750. JA 7-6500. A

MERCURY conv., 1956, tonneau cover, power steering, r/h, \$350. FR 4-8757. A

TABLE, 30"x48", wrought iron, 4 chairs, \$50. OR 1-4720 after 5 p.m. A

SHAMPOO CHAIR, styling chair, & operator's stool, \$40. FR 6-6543. A

PUPS, Yorkshire terrier, tiny show stock, A.K.C., \$150 & up. EX 6-6448. A

CHEVROLET, Bel-Air 1955 6-cyl., r/h, Powerglide, \$450. DA 9-1369. A

RECORD CHANGER, Hoffmann stereo-phonics hi-fidelity 20-watt w/6 wina speakers, \$125 or make offer. 329-5953. A

OLDS, 4-dr., Holiday, 1956, orig. owner, \$400. PL 4-6146, OR 7-7135. A

HOUSE, in Rolling Hills Estates, 3-bdrm., dining, living, & family rooms, w/fireplace, 2 1/2 baths, 2-car garage, drapes, carpeting, built-ins, lge. fenced-in view lot, covered patio, many extras, \$45,000. FR 7-4032. A

PUPS, miniature white poodle, champion stock, \$75 w/papers, \$65 w/out papers, DA 4-8663. A

VOLKSWAGEN, 1958, radio, good tires, \$1025; washer-dryer, O'Keefe & Merritt, \$110. FR 4-4786. A

DESK, 4-dwr., charcoal, \$15. OS 6-0749. A

VOLKSWAGEN, 1960, black, sunroof, radio, \$1400. 775-1753, PL 5-1553. A

BENCH SAW, 8" Craftsman, 1/2 h.p. motor, on stand, \$45. 320-5552. A

PIANO, Lester console spinet, Salem finish cherry wood, French provincial bench incl., \$450. OR 1-4124. A

FORD, 1956, 2-dr., auto, trans., \$250. 675-6700. A

C/B 3-ELEMENT BEAM master mobile, \$15; Heath HG10 VFO w/power supply, 80-2 meters, \$35; freq. meter BC 221J w/power supply & calb book, \$75; receiver, B6603DM w/power supply, \$10. OS 6-6169. A

ACCORDION, 120-bass beginner's, \$100; trumpet, \$10; ironer, Sears elec., \$25. OS 6-8331. A

SKI BOAT, 1960 Fantasy 16' Evinrude, 75 h.p., trailer, elec. startina, new tires, \$1300. 377-2101. A

FOR SALE

LATHE, Craftsman metal, 6" w/motor, 5" & 8" chucks centers, 8 1/2 faceplate, 3 headstock chucks, 5 tool holders, knurling tool, \$260. FR 9-8144. A

BICYCLE, tandem w/3-spds, chrome rack, \$80. OR 7-5617. A

SCUBA EQUIP., Aqua-Master reg. tank, mask, fins, depth gauge, \$100; Chev. Bel-Air, 1956, auto, trans., r/h, \$450. 329-7180. A

BED DIVAN, rose colored, \$97.50. DA 6-4379 after 4:30 p.m. A

ENGINE, Dodge V8 Red Ram complete, 1953, \$25, NO 5-2046 after 5 p.m. except Thursdays. A

GAME TABLE, custom-built, hardwood, natural finish, 7-sided, \$100. OR 2-5872. A

CEDAR CHEST, modern white Lane, \$20; radio & phono console, Emerson stereo, \$60; Chicago rollers, women's size 9, \$15; chest, baby's, \$7; wristwatch, man's Elain, \$7; DA 3-7576. A

BED, double, Sealy spring mattress & box spring, & chest, \$65. PL 5-7521. A

FORD coupe, 1947, new brakes, \$150. FR 2-6275. A

COFFEE TABLE, 2 step end tables, black marproof tops, \$8; stand, blond, 15 1/2" x 15 1/2" x 16", \$1.50; dresser, 2 large & 2 small drawers, good mirror, \$10; drop leaf table, square \$3; chicken wire, 39" small mesh, \$3. FR 2-1278. A

FORD, convertible, 1956, stick shift w/overdrive, \$425. Box 1101. A

ACCORDION, Blair, 120-bass, \$95. DA 4-5449. A

CORVETTE, 1961 rem. h/d top, white w/black int, 230 h.p., 3-sp, new tires, brakes, \$2875. 671-7356 eveninas. A

BUICK Wildcat, 1962 2-dr., h/top, bucket seats, ail power, 6600 miles, \$3100. DA 3-0979. A

REFRIGERATOR, 7.5 c. ft. Norae \$30; stove, aas, 36", \$30 or best offer; English Ford, Anglia, 1959 good tires, \$400; exercise bicycle, \$10; end tables, 2 & coffee table, blonde, Nevermar tops, \$5 ea. DA 9-6413. A

DINETTE SET, chrome, ext. 6 chairs, \$35; hotplate, 2-burner aas, \$3; car top rack, \$2. OS 6-8066. A

TYPEWRITER, Remington portable, \$20. AX 2-4958. A

BOAT, 15' Fisherman, homemade cabin, 30 h.p. Johnson, portable bait tank, trailer, fully equipped, \$470. 371-9730. A

PACER, Hedlund Hydroflite, \$24; record changer, Collero w/GE pickup & diamond needle, \$16; tape recorder, Webcor monaural, \$35. OR 0-4490 eveninas. A

LAWN MOWER, reel-type, new engine, \$35; bicycles, boy's 26" hvy. duty, \$20; 26", 3-sp., \$18; girl's, 16", \$5; fan, 18" \$5. PL 5-4497. A

PUPS, beagle, female, AKC, 6-wks-old, \$25. DA 3-6894. A

WASHER, Maytag, 1954, \$50. OR 1-0018. A

SKI BOAT, 13'6" Champion Saber, 1960, 1958 rebuilt 35 hp Evinrude, trailer, 1960 Wall factory, 4 life jackets, set of water skis, \$500. OS 6-8253. A

HUDSON, 1951 4-dr. & spare parts, \$75. OR 2-8629. A

TABLE CLOTH, Army-Navy w/doz. napkins, \$25; coverlets, quilted w/matching dust ruffles, parchment brown, polished cotton, for twin beds, 4 pcs., \$17. 897-9490. A

AUSTIN HEALEY, 1960, 3000 deluxe 4-seater, o/drive, wire wheels, white English leather seats, 17,000 miles, \$1850. OW 7-3328 after 6 p.m. A

SOFA, 7' blue tuxedo-style 5-mos-old, \$150; table, 6' 2-seat Danish modern w/center divider, nauqahyde cushions, \$35. 833-8238. A

CADILLAC Fleetwood, 1951, good trans., fully equipped, \$165. GL 4-0119. A

VOLKSWAGEN, 1959 sunroof, white side walls, deluxe upholstery, radio, \$1100. TO 1-6518. A

OLDSMOBILE, 1951 w/1959 ena. & 1955 Hydramatic, tuck & roll, new tires, \$400 289-5928. A

FORD, 1957, 2-dr, 2 tone paint, stick shift, new w/w tires & 36-mo. battery, needs ena. work, \$400. DA 4-7623. A

VESPA, low mileage \$180. CL 7-7047. A

WANTED TO BUY

PLAY SET, child's. FR 9-3134. B

BEDSTEAD or headboard, 3/4 FR 9-2081. B

FOR TRADE

G.T. LANCER-DODGE, 1962 payments trade for Volkswagen sedan, 1963 or Volkswagen Karmann Ghia 1962 payments. PL 5-0160 after 6 p.m. C

G.I. BALL AMMO 30-06 cal. Trade for same type in .45 cal. ACP or .30 cal. carbine. OS 5-2081. E

FREE (to be given away)

KITTENS, calicos, tabbys & tigers. DA 7-9934. D

RENTALS OFFERED

HOUSE, 1-bdrm., furn., in rear, adults only. \$98 mo. incl. utilities. OS 5-7937. A

MOUNTAIN CABIN, 4-bdrm., 1 1/2 baths, furn., 3 miles from Lake Arrowhead Village, for vacationers June-Sept., \$65 week or \$200 mo. DA 4-5774 eveninas. E

Girl Scouts

(Continued from Page 1)

tools, household goods such as furniture and appliances even if broken, books, pictures, toys, baseball gloves, bats and balls, gardening equipment. "Anything you can find around the house you don't need or don't want bring it to our trailers," say the girls. "We will surely be able to sell it."

The rummage sale will take place on July 2.

NRC Girl Scout commissioner is Ester Cook.

For inquiries about the program, call Personnel Activities, extension 2784.

NRC Campers Plan Outing For June 29--

The NRC Camping Club, Max Douglas, commissioner, invites Northrop outdoor types and their friends to the big outing planned for June 29 and 30 at Toll Camp in the San Bernardino Mountains near Lake Arrowhead.

Total distance from Hawthorne is 115 miles.

Max points out that the most direct route to Toll Camp is via San Bernardino Freeway to San Bernardino, turn off on Highland Avenue as far as Sierra Way to Highway 18, turn left into the mountains to Lake Arrowhead turnoff. Take Arrowhead Road to the village, turn right on North Shore Road. Continue on across the dam, past the hospital sign and University Conference Center sign. The camp is 1 1/2 miles beyond the Center sign.

There will be a potluck dinner at 5:30 p.m. on Saturday, says Max.

RENTALS OFFERED

APTS, new, Gold Medallion, 1 & 2 bdrm. units, near plant, pool, subterranean parking, patio, private balconies, built-ins, carpets, drapes, radiant heat, July occupancy, unfurn., \$120 mo.; furn. \$137.50 mo. 326-0474. E

APT, 1-bdrm., unfurn. w/w carpeting, stove avail., laundry facilities, water & trash pick up pd., adults only, 1/2 mile from Northrop, \$80. OS 6-8283 after 3:30 p.m. E

APTS, 1 & 2 bdrm., unfurn., w/w carpets, drapes, built-ins, all elec., radiant heat, garbage disposal, garage & storage comp., \$110 & \$145. 371-5037. E

DUPLEX, 2-bdrm., pvt. garage, drapes, disposal, water & trash pd., adults only, no pets, \$100 mo. OS 6-1985. E

HOUSE, 1-bdrm., sleeps 5, private patio, \$40 to \$75 weekly w/discount if rented for 2 to 4 consecutive weeks. EX 1-2989, EX 1-3606. E

APT, 1-bdrm., furn., w/w carpeting & drapes, built-in elec. range & oven, pool & garage, \$125 mo. 370-2051 or 371-2826 after 5 p.m. E

APT, 3-bdrm., 2 baths, fully carpeted, on beach at Redondo Beach Esplanade, swimming pool, steam bath, garage, built-ins. \$210 mo. FR 8-8660. E

HOUSE, 3-bdrm., convert, den, 2-bath, drapes, w/w carpeting, fireplace, built-ins, fenced & landscaped, close to schools, avail. July 12, lease required, \$265 mo. FR 8-6181. E

APT, bachelor, furn. complete kitchen, 4.5 miles from Northrop Palos Verdes, ocean view, \$65 mo. incl. utilities. FR 7-1218 after 6 p.m. E

HOUSE, 4-bdrm., unfurn., gardener & water supplied, 4 blocks from Northrop, \$130 mo. TE 3-2512. E

CABIN, Crestline, near Lake Gregory, sleeps 6, 2 baths, June to Sept. \$60 wk. EX 1-2040 after 4:30 p.m. E

PERSONALS

THANKS to the NRC, Northrop, McDonnell personnel for the many cards & flowers received during my recent hospital stay. JAN WOODS. L

FOR SALE OR TRADE

CONSTRUCTION MATERIALS, electrical, \$75 or trade for typewriter, desk, encyclopedias. OS 6-5253. M

VOLKSWAGEN, 1962, low mileage, \$1700 or take down pymt. DA 3-2883. M

High Honor for NRC



SPONSOR OF THE YEAR—The NRC has been named sponsor of the year by the Centinela Valley Girl Scout Council. Award took place at a recent dinner, theme being "Look Around You." Photo shows Maud Gruber, president, Centinela Girl Scout Council, presenting trophy to Fred Armstrong, NRC president, and Ester Cook, NRC Girl Scout commissioner and skipper of the Club's 262-S (Mariners).

No Chavez Ravine



PART OF THE GAME—Northrop Norair photographer generates baseball diamond realism during photo session of NRC-sponsored team at play in Alondra Park. Here members of the Softwares first place slo pitch aggregation provide the heated atmosphere. From left, Gary White, Jack Conray, Eric Barner, Tom Screen, Rudy Fontez, and Jack Stevens.

Organ Club and Elks Club Sponsor Yesteryear Concert

The NRC Organ Club has joined forces with the Inglewood Elks Lodge to co-sponsor a fond memories style organ concert, it has been announced by Gail Skinner, commissioner.

"This concert is planned to bring back pictures of yesteryear," states Gail. "It will take place June 26, 8 p.m. at the Elks Lodge, 317 South La Brea in Inglewood.

Gaylord Carter, official organist at the Sports Arena and Paramount Pictures, will be at the console of the new Baldwin.

Mr. Carter is particularly fitted to carry out the theme of the eve-

ning, for many Los Angeles area people heard him during the years when he played at the Million Dollar theatre, the Paramount downtown, and Grauman's Chinese and Egyptian theatres in Hollywood.

Also on the program to lend additional authenticity, a silent film comedy will be screened and Mr. Carter will play the accompaniment in the exciting measures oldtimers remember so well.

"Get up a party," Gail says, "and join in. It will be fun, positively."

Tickets will be available at Personnel Activities office. Price is \$1 each.

INDEPENDENTS, COMPUTERS LEAD SOFTBALL RACE

The NRC softball team stands as of the end of the first week in June:

Regulation pitch	Won	Lost
Independents	3	0
Red Hots	2	1
Twisters	2	1
Lions	1	1
Dark Horses.....	1	1
Allee Cats.....	0	2
Piranhas	0	3

Slo pitch

Computers	3	0
Carroll's Clowns.....	2	0
Softwares	2	1

NRC SPORTS CAR CLUB TO STAGE DEL CAMINO 8

The next event scheduled for the NRC Sports Car Club is the Del Camino VIII SCCSCC championship slalom in June.

The meet takes place on June 30, Sunday.

Sports Car Club folk are advised by Les Landstrom, commissioner, to stop for free breakfast tickets at Perrin's Imported Cars, 4242 Crenshaw.

Ratfinks	1	2
Aero	1	2
Sloths	0	2
Cramps	0	2

NORTHROP NORAIR NEWS

Issued biweekly by Norair Division of Northrop Corporation

• Wednesday, July 3, 1963

HAWTHORNE, EDWARDS AFB, PALMDALE

SAN ANTONIO, EL PASO

NORAIR FAMILY DAY SUNDAY, JULY 14

Tour Route and Parking Map, see Inside Pages

NSL is Building 5-Story Space Science Center

Construction work has begun on a five-story space science center for Northrop Space Laboratories at Hawthorne, it has been announced by Thomas V. Jones, Northrop Corporation president and chairman of the board.

The steel and masonry space science center will accommodate between 800 and 1000 persons for the design and production of

manned and unmanned spacecraft systems, including related research, reliability assurance, and systems engineering.

The high rise structure will conform architecturally to the Norair Engineering and Science Center. Estimated cost of construction is approximately \$2,500,000.

The new space science center will contain laboratories on the first floor and engineering facilities on the upper four floors. It will adjoin the present two-story NSL building. Partial occupancy is scheduled for the first week in November 1963. The construction project is to be completed by the end of the same month, including modification of a portion of the existing NSL facilities. The Austin Company is designer and contractor for the 130,000 square foot building.

TOMORROW—! 4TH OF JULY, A HOLIDAY

Tomorrow is a holiday.

All Norair Division facilities will be closed Thursday, July 4, in observance of Independence Day, a Norair-paid holiday.

The following Friday, July 5, will be a regular workday.

Norair Awarded Contract For Booster Engineering

Northrop Corporation has received a contract from United Technology Center for engineering services in the solid propellant booster portion of the Titan III space launch vehicle program.

Work is being carried out under the jurisdiction of Norair's Technical Operations department, Jim Matthews, manager.

Engineering services to be performed will include:

Functional analysis of ground equipment, including maintainability, logistics and training requirements.

Design of aerospace ground equipment and certain motor structural components.

Stress, structural and dynamic analysis of motor, attachment structures and ground equipment.

Support functions such as field
(Continued on Page 3)

Opening Ceremonies at Plant One Lobby, 1 p.m.

Plans and arrangements for an all-out Northrop Norair Family Day have fully materialized.

It will be held Sunday, July 14, from 1 to 5 p.m.

The entire plant with the exception of closed and restricted areas will be open.

The program will include a tour of Northrop Space Laboratories.

Product displays from other divisions to be featured.

This will be an open door to the Norair assembly lines, Engineering and Science Center, and the research and test buildings. Mama, papa, junior and sis, grandma, grandpa, aunts, and uncles and cousins will be able to leisurely tour the Hawthorne facility.

Opening ceremonies will be at Plant One lobby, 1 p.m.

No identification is required of Family Day visitors, however, employees are asked to wear their badges for

easy recognition.

It will be on the do-it-yourself host plan, where Norair people can show the family where they work, meet the boss and meet other co-workers, see where friends work.

F-5 and T-38 Contracts Awarded Northrop Corp.

Air Force contracts totaling \$129,572,500 have been awarded Northrop Corporation for the production of the F-5 Military Assistance Program aircraft and for T-38 supersonic trainers, it has been announced.

Fourteen months ago, Northrop Norair was picked by the Defense Department to produce fighter aircraft for selected allied nations, but no dollar figures were released.

The announcement said the first contract for F-5A and F-5B airplanes totals \$80,747,500.

The F-5A and 'B are single-seat and double-seat versions of a 1000 m.p.h. fighter developed at Norair as a versatile and economical weapon to replace aircraft becoming obsolete and difficult to maintain in allied countries. Advanced Production line

F-5s will be on display during Family Day, July 14.

The second contract, for \$48,825,000, represents a new increase in the USAF purchase of the T-38.

NORAIR NEWS MOVES TO THE TOOLING BLDG.

The Northrop Norair News office and personnel have moved from the Engineering and Science Center to the second floor of the Tooling building.

The mail zone is 10.

The telephones remain the same, 2456 and 2457.

The Tooling building is the westernmost structure on the Field—corner of Prairie and Broadway.

Co-chairmen of a 25-member Family Day planning committee are John Breneman, manager, night Operations, and Paul Wierk, director, Technical Administration.

Corporate Vice-president and Norair General Manager Dick Nolan personally extends a welcome to all members of the Division.

Mr. Nolan stated, "I invite all members of the team to bring their families and relatives to see our T-38 and F-5 airplanes on the production line. The Laminar Flow Control airplane and a complete Air Force-accepted T-38 will be on display. This will be an excellent opportunity for those at home to see the job we are doing in support of the defense programs of America and the free world.

"Mrs. Nolan and I will be there as will other members of management and supervision to help make your visit pleasant, informative and interesting.

"I have also extended invitations to personnel of the United States Air Force. Mr. Beck, our acting director of the Materiel department has invited our sup-

(Continued on Page 3)



JOHN R. CLIFTON

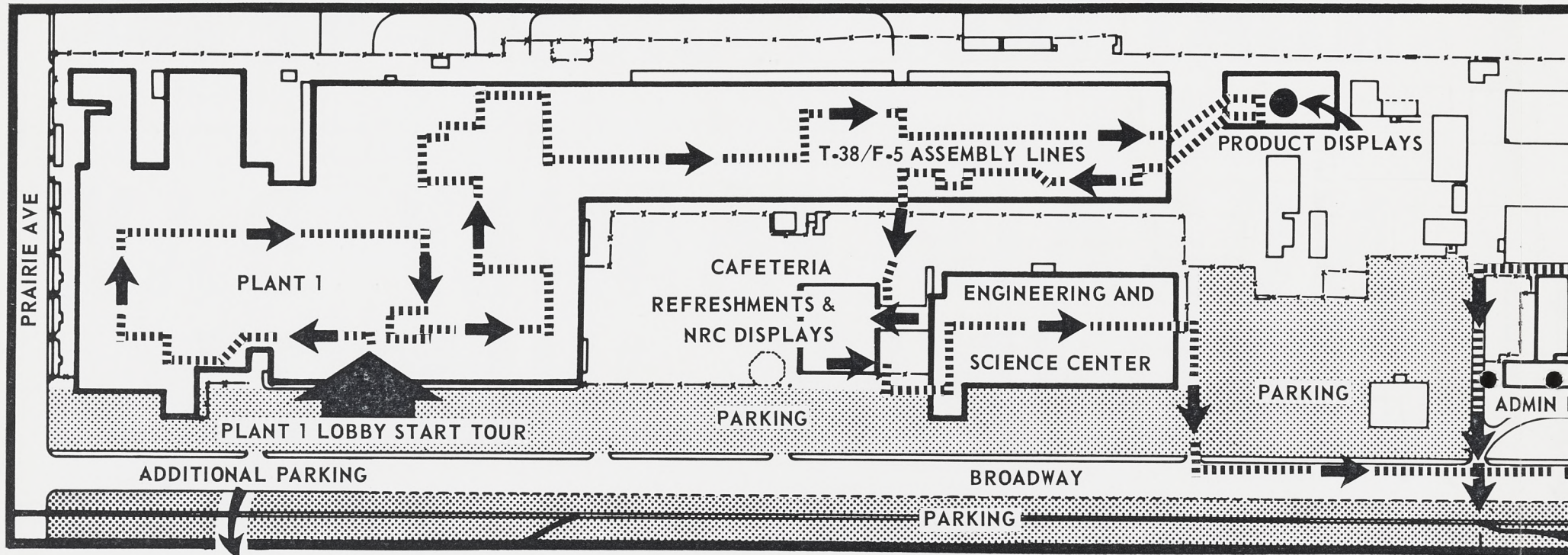


HERBERT S. RIPLEY

NRC ART SHOW WINNERS

See Page 4

SEE THE T-38/F-5 ASSEMBLY LINES, THE MACH 14 WIND TUNNEL,



Procedure for Fair Play

Today it is my happy privilege to talk about what I think our greatest "fringe benefit" is.

I call it Northrop's procedure for fair play.

In the introduction to Working with Northrop, our president, Tom Jones, makes this statement — "It is our policy to treat our people not as cogs in an industrial machine but as individual human beings with ambition, intelligence, and dignity. If at any time you feel you are not being treated that way, we want to know about it."

This is, in summation, the credo of the Northrop personnel policy. The philosophy of recog-

By John B. Clark

nizing every member of personnel as an individual and not as a cog in a machine, has been actively pursued by our management since the first day we opened our doors and has, in my opinion, provided us with our greatest "fringe benefit."

The recognition of people as individuals with human dignity is expressed in many of our policies and practices. I think the most meaningful one is our procedure for fair play; its title "The Grievance Procedure."



It's easy to publish a policy but it gets its meaningfulness through the establishment of a procedure for implementation. Let's take the phrase in Tom Jones' statement "we want to know about it." If you want to know about "it," it being a gripe or a complaint, you have to provide an orderly procedure for fair play. Many companies have made similar statements in the form of, "My door is always open"; they then sit back and wonder why no one comes in the door.

Here at Northrop we have the Northrop Grievance System which allows you to get on the other side of the door. You are, of course, familiar with it and you should be, because it is this company's way of establishing a procedure for fair play. Whether

your grievance is based on fact or fantasy, if it is real to you we want to know about it.

The first step is what I choose to call the Notice and Explanation stage. As you know, most difficulties can be solved between the people involved. In most instances this stage takes place between the individual and his immediate supervisor in the office or the shop. Any procedure for fair play requires a Right of Appeal, and if the complaint is not fully settled in the Notice and Explanation stage of the first step, the grievant may then visit Employee Relations and ask for their counsel. Of course, you may come before that if you wish.

It is at this point that management of the section wherein the grievant is employed is asked to answer the complaint. Experience indicates that many disputes are settled at this step. However, if the grievant is not satisfied with the findings he may then carry his case to what is known as the "Management Appeals Committee" composed of the president of the Corporation, or his designee, the head of the department concerned, the director of Industrial Relations and Security and an Employee Relations representative. In his presentation before the Committee, the grievant is invited to call witnesses and his case is given a complete and thorough review. Every opportunity is given to all parties to present evidence, argument and explanation.

In addition to Notice and Explanation and Right of Appeal, every procedure for fair play recognizes there be Rights to Remedy. The Management Appeals Committee has a full scale of remedies available, and if they find that the requirements for fair play have not been met either in substance or form, they do not hesitate to grant the appropriate remedy to the grievant.

If, however, the Committee in its decision, denies the grievant full satisfaction, he may still proceed to yet another step; that is, to take his case before a professional arbitrator. The decision of the arbitrator is final and binding on all parties to the arbitration and is the final step

of the procedure. The company's willingness to proceed to this step is an indication of its firm belief in the integrity of its personnel policies and its belief in a procedure for fair play.

As director of Industrial Relations and Security, it has been my privilege to participate as a member of the "Management Appeals Committee," and I must say that I have not come away from any one such meeting without a renewed and more intensive pride in Northrop management and its positive pursuit of the recognition of all our employees' individual dignity. Over the years I have heard literally hundreds of expressions, verbally and in writing, from the members of our personnel citing our grievance procedure as being, in truth, our greatest personnel fringe benefit. I agree wholeheartedly.

Machine Know-how



NUMERICAL CONTROL CLASS—Paul Wurzer, instructor, Education and Training, explains binary-coded tape as part of data input methods used on numerical control machines. Personnel from Tooling Maintenance, Parts Programming, Manufacturing Research and Development, and Quality Control, attending the 16-week course in "Fundamentals and Principles of Numerical Control" are from left, front row, Joe Pillow, Mechanical Maintenance; Gaston Meuleman, Manufacturing Research; Oscar Hann, Quality Control; M. P. Stash, Manufacturing Research and Development; E. A. Demianiuk, Mechanical Maintenance; and W. B. Garrison, Mechanical. Second row, from left, Leo Barnhill, Industrial Electronics; Bill Hunt, Quality Control; J. R. Johnston, Paul Sizemore, and Leo Tanke, Industrial Electronics. Third row, from left, T. K. Bridges, Plumbing and Hydraulics; R. E. Demers, Master Dimensions; R. C. Peterson, Numerical Control; R. J. Steel, Plumbing and Hydraulics; and Gabor Toth, Industrial Electronics.

AIAA Hears Stancil Method For Optimum Launch Angle

A simplified computer procedure for determining the optimum angle of attack for a variety of rocket boost missions was presented to the American Institute of Aeronautics and Astronautics by Robert T. Stancil, Norair engineering supervisor.

The AIAA conducted its Summer Meeting last week, at the Ambassador Hotel.

For rocket vehicles, Northrop's new, computer-based method incorporates the best features of the "steepest ascent" and classical Calculus of Variations methods to find the optimum trajectory for a vehicle.

The procedure makes the engineer's job easier by not requiring use of abstract parameters or an estimated performance increase.

The primary feature of the method is determination of the rocket vehicle's angle of attack in the "optimizing" direction. First, approximate partial derivatives of final velocity are established with respect to the final values of

other variables. Then the final values of the Lagrangian multipliers are found by using the partial derivatives. These final values determine the values of the multipliers through the entire trajectory and the optimum angle of attack is solved for successively improving the trajectory.

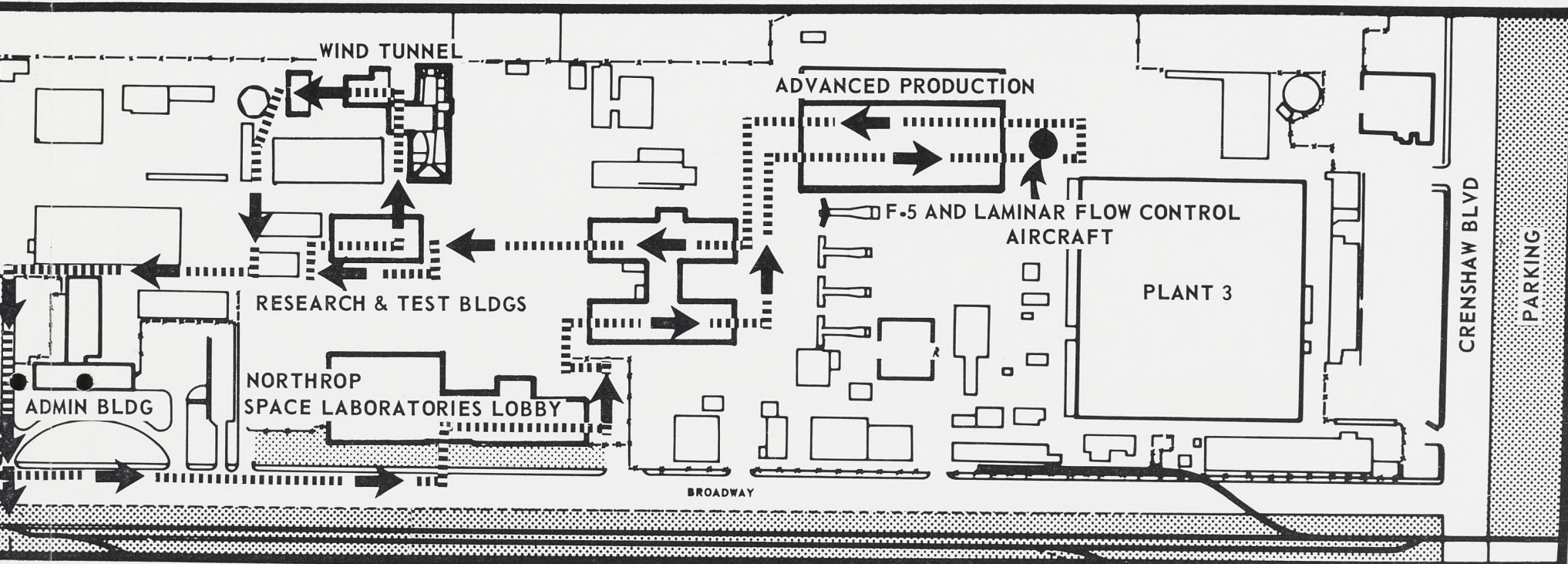
LEUZINGER OPEN TODAY, PHOTOG WILL BE THERE

Today marks the opening of another summer of free swimming fun at the Leuzinger High School outdoor pool for all Norair personnel.

Summer reconditioning of the pool has caused a slight schedule slip resulting in a delayed opening date. Instead of July 1, as previously scheduled, it opens today, July 3.

A photographer will be on hand to take pictures of what promises to be an exhilarating swim session.

WIND TUNNEL, THE LFC AIRPLANE — SHOW THE FAMILY WHERE YOU WORK



Engineering Services

(Continued from Page 1)
service, technical writing and computer services.

Norair officials appointed to head the program are John R. Clifton, chief, Special Projects group, who will be project manager; and Herbert S. Ripley, formerly project manager, Northrop Space Laboratories, who will be assistant project manager.

The work will be done at UTC headquarters in Sunnyvale; at the UTC Development, Processing and Test Center, Coyote; at Northrop Norair in Hawthorne; and at future Titan III test sites.

UTC will produce the solid-propellant motors at Coyote. Static preflight testing will be conducted at Coyote and at Edwards Air Force Base.

A division of United Aircraft Corporation, UTC is an associate prime contractor for Titan III-C, which will be boosted by twin, 120-inch diameter solid-propellant motors providing a lift-off thrust of more than 2 million pounds.

Titan III-C has been designed as a "workhorse" space booster capable of putting a variety of manned and unmanned payloads of up to 25,000 pounds into orbit. First flight tests are scheduled from Cape Canaveral in mid-1965.

Mr. Clifton, project manager on the UTC program, comes to Norair from American Astro-Systems where he was vice-president of Engineering. He first worked for Northrop in 1943 where during a 13-year period he held the positions of engineer, Hydraulics; group engineer, Hydraulics and Landing Gear; staff engineer, Mechanical Design; and supervisor, Advanced Design, Airplane Projects.

Mr. Clifton has also been

consultant to Coleman Engineering and chief engineer for Air Logistics Corporation.

He was educated at the University of Southern California where he earned his degree in business administration and at Aero Industries Technical Institute where he received a degree in aeronautical engineering.

He served in the Marine Corps during World War II.

Mr. Clifton holds numerous Norair patents.

Mr. Ripley, who has been with Northrop since 1958 has served as supervisor, Mechanical Systems Support Equipment; as Norair engineering representative at Central District Office, Dayton, Ohio; project management on the Prospector Project and as project manager for Northrop Space Laboratories.

Mr. Ripley was educated at Chaffey Junior College where he received an associate of arts degree in 1937. He subsequently engaged in engineering courses at El Camino and UCLA; in business administration studies at Alexander Hamilton Institute; and public speaking and human relations, Dale Carnegie.

He also holds an aerospace invention for a flap control system and has received a patent award.

TENNIS TEAM TO SQUARE OFF IN DECIDING TILT

The Northrop Industrial tennis team will face off against Hughes on Thursday, July 4, 10 a.m. to 3 p.m. at the Compton Junior College tennis courts for what will be the deciding game of the Industrial League championship.

Northrop's star-studded roster is composed of four "A" players. Among them are Bob Sassone, Anaheim, a top Southern California netter; Bill Lurie, Norair, ranked nationally in the senior division, Harry Ohls, Norair; Bob Reese, Ventura.

The doubles teams are composed of Sassone and Lurie; Ohls and Bill Armstrong; Reese and Don Theleman.

Those interested in top-level competitive tennis should be in attendance to view the exciting matches for the Industrial championship.

FAMILY DAY TOUR—On the map above, the Family Day tour is outlined by arrows. It will start at 1 p.m., July 14, in the Plant One lobby, near Broadway and Prairie. Visitor parking will be available in both plant and Yukon Street lots with additional parking along Broadway and railroad tracks. Strollers are recommended for toddlers. Outstanding attractions on the tour will be T-38/F-5 production lines, walk-by of the F-5, and Laminar Flow Control aircraft. A complete Air Force-accepted T-38 will also be on display. Refreshments will be served free in the cafeteria. (See story for details.)

Coast Guard Appointment For Sepel Jr.

George Sepel, sr., five-year Norair man, Contract Pricing, has been notified that his son, George Sepel, jr. received an appointment as cadet to the United States Coast Guard Academy.

Official notice was received from Admiral E. J. Roland, USCGR, commandant, that George is to report to New London, Connecticut, on July 8, and prepare for an indoctrination cruise, returning to the Academy in time to start the fall semester.

George graduated from Covina High School, June 12, where he was a member of the varsity



SEPEL AND SON

basketball and track teams. He was also president of the Latin Club, secretary of athletics and state delegate to the Civitan Convention in San Francisco.

He received the Senior Varsity Basketball Scholar award and has been elected to the Montview League Forum for outstanding high school seniors.

When George completes four years at the Academy and receives a commission he plans to continue his education and career in the Coast Guard with emphasis on international law.

Northrop Norair to Hold Family Day — July 14

(Continued from Page 1)

pliers.

"The Corporate office and other Company divisions have been invited to attend and to bring displays of their products for exhibit on that day.

"I look forward to this Family Day and believe it will be the best in Norair history."

Some highlights visitors can expect:

Gun nose for the F-5.

T-38/F-5 medallions, being stamped out on the tour line, and free to visitors.

Working demonstrations of numerical control machines.

Computer room demonstrations.

Special tools in operation.

Cafeteria displays for the NRC clubs and groups.

The new hypersonic wind tunnel and related equipment.

The F-5 advanced production airplanes.

An animated display of the LFC system.

The Northrop Ventura ring-sail parachute system that has brought America's astronauts down safely.

A scale model of Mercury space capsule.

A gallery of Company awards.

Aerospace flight gear.

Northrop Architectural Systems product display.

Many, many others.

There will be free refreshments in the cafeteria.

Note—Ladies are advised to wear low heels for comfort. Also, and a good idea, bring strollers for the little tots.

T-38 Transatlantic



AND BACK FROM PARIS—Major Jimmy L. Nichols, left, and Captain James E. Daniel are greeted by Randolph's 3510th Flying Training Group Commander, Colonel James H. Watkins, after they stepped from the first of two T-38 Talons to land at Randolph after concluding a 9000-air mile round trip which took them overseas to participate in the Paris Aeronautical Salon airshow at Le Bourget Airport near Paris, France. Pilots of the second supersonic trainer were Major George Holt, Captain James Light, jr.

NORTHROP NORAIR NEWS

VOL. 21

NO. 12

1001 E. Broadway, Hawthorne, Calif.
A NORTHROP CORPORATION
PUBLICATION
NORAIR DIVISION

Published every other Wednesday

CHARLES BRADFORD, Editor

Permission to publish material with credit to Northrop Norair News will be granted. News office extension—2456. Outside lines—OR 8-9111, OS 5-4611.



RIDES WANTED

7:30 a.m. — 4:15 p.m.

VERMONT & FLORENCE, Los Angeles. Gary Adams, ext. 691. PL 9-2755. 3

SUNSET BLVD. & PACIFIC COAST HWY., Pacific Palisades. Josh Treiman, ext. 1937. 3

8 a.m. — 4:45 p.m.

SAWTELLE & CULVER, Los Angeles. Michael Sirmyer, ext. 1481. 391-6860. 5

CULVER BLVD. & SEPULVEDA BLVD., Culver City. Peter P. Garrihan, ext. 2425. VE 7-2942. 5

VERMONT & ALONDRA, Gardena. Vernon L. Johnson, ext. 1545. DA 7-0219. 5

VAN OWEN & MASON, Canoga Park. R. F. Kissling, ext. 1401. 347-0888. 5

3:45 p.m. — 12:15 a.m.

PACIFIC COAST HWY. & TOPAZ, Redondo Beach. Bonnie J. Bryan, ext. 2250. 374-2945. 6

RIDES OFFERED

8 a.m. — 4:45 p.m.

VAN OWEN & MASON, Canoga Park. R. F. Kissling, ext. 1401. 347-0888. 15

BBSF Classified Ads

BBSF classified ad service is provided free of charge to all Northrop Norair personnel.

Ads for agencies, commercial enterprises and private businesses are not accepted.

Deadline is noon Wednesday, one week before publication.

FOR SALE

RESIDENTIAL LOT #56, 67 1/2 x 97 1/2, 450 shares of Local Water Co. stock, Lake of the Woods, 6 miles east of Frazier Park, \$1500 & take over payments, bal. \$1275. 676-0740 after 6 p.m.

CHEVROLET, 1957, 210 series. r/h, auto. trans., new tires, \$600. OS 5-0013. A

VACUUM CLEANER, Hoover, \$10; carpet, wool, grey, 9'x12', \$40; refrigerator, 13 cu. ft., top freezer, \$40; dining room set, blonde, ext., 4 chairs, \$25; end tables, mahogany, \$5; twin beds, w/ Beauty Rest Sealy mattresses. \$40 ea. PL 5-4534. A

SECTIONAL, 2-pc., foam rubber, coral color, \$20; chair, black, w/silver thread, \$30. FR 5-5237. A

WIRE WHEELS, 15" chrome, 4 1/2" bolt circle, fits Ford Thunderbird, Chrysler, \$125. EA 2-5853. A

HOUSE, Del Amo area, 3-yrs-old, 3-bdrm., 2 baths, lae. family rm., carpeting, drapes, block wall, financing. \$26,500. 326-5874. A

MOTORCYCLE, 1956 Ariel, 550 cc, single, \$199. ST 8-9709. A

FURNITURE, antique, Chinese hand-carved, tea table w/4 stools, \$300; chests, 3, 12 1/2 x 25, \$150; 15 x 32, \$250; 20 x 42, \$495. Box 1201. A

HOUSEHOLD GOODS, box springs & innerspring mattress, Englander firm, \$30; chest of drawers, high chest on chest w/8 drawers, dark finish, \$20; table lamps, 2, white, \$2 ea.; lamps, 2, pull-down, \$3 ea.; quilt, very hv., \$3. 327-4087 eveninags. A

BEDROOM SUITE w/box spring & mattress, blonde, \$20; desk, 4-draw., charcoal & black, \$12; refrigerator, Philco, \$50; stove, Welbilt, \$50. OS 6-0749. A

RANGE, gas, 42" Tappan, \$60; kitchen set, chrome, 4 chairs, \$20; medicine cabinet, \$4; light fixture, \$1. FR 5-2866. A

RUNABOUT, 12' Kelton-type, 15 hp Evinrude, \$300. DA 3-4628. A

SURFBOARDS, 9' Gordie, 3/4" redwood stringer w/orange pigment, \$50; Diwan, 9'. \$35. DA 3-1546. A

BICYCLE, Schwinn, boy's 26", single spd., \$25. DA 4-8663. A

HAM RECEIVER, National NC173, covers 80, 40, 20, 15, 10, 6 meters & broadcast band, \$90. OR 7-7949, OR 2-4426. A

KITTEN, Seal-Point Siamese, 8-mos-old, without papers, \$15. 346-6959. A

UTILITY TRAILER w/8' bed, bumper hitch, hv., duty, fits any size bumper, \$50. DA 6-8010. A

SURFBOARD, 8' 10" Jacob & Velyz foam board w/2" balsa strip, \$55. FR 4-6003. A

STEREO UNIT, Barzilay oiled walnut, table, Fisher 500-B FM multiplex REK-O-KUT turntable, arm. Shure cartridge speakers, 2, Alec Lansing, 12", \$700; Karmann Ghia, Blaupunkt 3-band radio, w/w, \$1225. 933-1793, 933-6665. A

FOR SALE

CORVAIR, 1962, Monza, 2-dr., white w/blue leather, r/h. \$300 down, take over payments \$1700 balance. 783-0518 after 6 p.m. A

TRAVEL TRAILER, 16' Santa Fe, 12-volt battery & system, thermo-controlled heat, dual butane tanks, new w/w nylon tires, hydraulic brakes, \$995. AT 2-9360. FREEZER, 20 cu. ft., \$125. OS 5-6081. A

HONEY, unheated, this year's production, 2 flavors, \$1 at. NE 8-6065. A

OLDSMOBILE 88, 1952, r/h, \$150. PL 6-7284. A

HOUSE, 3-bdrm, family room, view, pool, by owner, Rolling Hills Estates, \$38,900. FR 8-1976. A

PACKARD, club coupe, 1956, r/h, automatic, elec. torsion bar suspension, auto. antenna, p/brakes & steering. \$300. 362-9380. A

PIANO, Brambach baby grand, 5' length, 3-pedal includes separate bass sustainer. \$795; tonneau cover & rear side curtains to fit MG-TD model, \$20 FR 2-8333 after 5:30 p.m. A

MOTORCYCLE, Zuzuki, Honda-type, elec. starting, directional signals, 900 actual miles, over 70 mpa, \$225 or best offer. FR 4-1725. A

BOAT, Glenn L. Swish, elec. bail pump, trailer, ridequide steering, Mercury 700, misc. access., \$900. FR 4-3848. A

MG-TD, 1952, needs top & seat covers \$425 or offer. OR 2-2434. A

RANGE, gas, clock, grill, thermo. oven control, broiler, avail. July 15, \$50 AX 3-2829. A

BOAT, 15' Fisherman kit, 30 hp Johnson motor, port. bait tank, trailer, controls, \$475. 371-9730. A

RANGE, elec., Cromwell, auto. controls, deep well, \$75. OS 1-4582. A

RUG, washable, 9'x12', green, \$4. Box 1202. A

MASSAGER, Niagara hand-type, \$48; knitting machine, German-made, \$98; calculator, 8" Binary, \$5. DA 6-4195. A

CORVAIR MONZA, 1963, 102 hp, 4-spd., magnesium wheels, improved suspension, \$2400. FR 6-9651 after 5:30 p.m. A

SPRITE, 1959, new tires & brakes, carbs, just rebuilt, take over \$51.30 payments plus \$125 for equity, \$974.70 bal. inc. insurance. 676-1422. A

AUSTIN HEALEY SPRITE, 1960, 17,000 miles, many extras, 35 mpa \$1095. AT 2-4083 eveninags & weekends. A

FISHING BOAT, 32', sleeps 3, aallev. etc., 345 aal. gas tanks \$3000. 867-1476. A

BED, double, Sealy spring mattress & box spring, chest of drawers, \$65. Box 1203. A

DESK & swivel chair, \$25; square rla sailing model, \$25; 1/4" plastic hose, 5' a ft.; rainbird sprinklers, \$1; manale, Kenmore, \$15; steel lounges & pads, 2, \$10; 6' cedar posts, 25¢. OS 6-5253. A

RADIO, RCA table-model, 45 rpm record attach., \$20; lamps, pr., charcoal, modern. \$9. Box 1204. A

HOME, Hollypark, 3-bdrm., 1 1/4 baths, drapes, new carpets, financing avail. \$23,000. PL 6-3245. A

CAR AIR COOLER, Wright, \$20; surfboard, balsa wood, 9'3", \$25. OR 2-6877. A

ENGLISH FORD, 1961, about 30 mpa, \$200 cash & take over \$37.34 mo. payments, \$400 bal. 674-1672. A

TR-4, 1962, r/h, w/w, tonneau cover, less than 10,000 miles, \$2500. FR 2-3878. A

WASHER, 1960 Norae auto., 8-cycle, 2-spd. \$50; table, lae., chrome w/leaf & 4 chairs, \$20. HA 1-6089. A

BOAT, 16' glassed inboard w/trailer, 1941 V-8 eng., w/dual manifold, lots of extras, \$650. FA 8-4188 after 5 p.m. or weekends. A

GORDINI, Renault, 1961, 20,000 miles, w/w, 40 hp, 4-spd., htr., tilting seats, kiddie locks, w/s washers, luqaqae carrier, tools, \$900. 675-5457. A

RILEY, 1951 2 1/2 liter, 4-dr, sedan, 100-hp twin-camshaft eng., 4-spd. shift, \$795. 375-0449. A

SINK, for service porch, \$5; cannina jars, 50¢ doz. VE 7-4237. A

HONDA, 1962 Zuzuki, 50 cc, 900 actual miles, elec. starter, directional signals, \$225. FR 4-1725. A

PAINT SPRAYER, Craftsman diaphragm, 3.3 cfm at 35 lbs., on dolly w/int. & ext. mix pressure-type gun, \$50; saw, Shop Mate, 6 1/2" skill-type, \$17.50; sabre saw, Craftsman, \$10. SP 2-1992. A

AUSTIN HEALEY, 1960, 3000 deluxe 4-seater, o/drive, wire wheels, 18,000 miles \$1850. OW 7-3328 after 6 p.m. A

MODEL A FORD, 1930 coupe, runs fine, needs paint & upholstery, \$225; engine, 1955 Oldsmobile 88, \$100. Box 1205. A

BICYCLES, boy's 26", 3-spd., \$18; girl's 26", \$16; motor scooter, \$50 or offer. PL 5-4497. A

FORD 1953 new tires, battery, Victoria model, \$100. ME 0-1696. A

HI FI, 2" Heathkit, 55-watt power amplifiers, model W-7M, \$40 ea. HA 5-8578. A

HILLMAN, Minx, 1960, 4-dr, sedan, 4-spd. trans., floor shift, r/h, new engine, \$600. DA 3-9720. A

LAND, 5 level acres in Northern Calif., Lassen County, will sell half, \$200 an acre, \$1000. FA 0-2097. A

NRC Art Show Trophies



ART WINNERS—Winners of NRC 15th Annual Art Exhibit, recently concluded in the Plant One cafeteria are from left, seated, Julie Carlson, second place dry medium; Alice Adams, third place dry medium; John Kayser, Art Club commissioner, sweepstakes and second place oil; Betty Rumphorst, honorable mention dry. Standing, from left, Thomas Kulp, first place dry and third place water color; Gene Price, honorable mention oil and water color; Charles Caudill, first place oil, second place water color; Erling Henriksen, first place water color, third place oil.

BOB LUXTON ON RADIO KABC'S BENNY-THE-FAN

Norair's Bob Luxton, NRC representative and specialist in little league baseball has been twice an interviewed guest on "Benny the Fan", a sports commentary program, radio KABC.

It is all due to his knowledge, deep perception and study of America's national pastime.

Bob appeared on successive weeks, June 21 and 28.

WANTED TO BUY

MOVIE CAMERA, magazine load, 8-mm. OS 6-8331. B

AUTO, 1957 model or later will pay \$500 for clean, good running auto. OR 8-7374 after 6 p.m. B

SCUBA DIVING equipment, OR 3-3006. B

REFRIGERATOR & washing machine, elect. FR 9-4517 eveninags. B

SHOTGUN, 16 ga., autoloading or pump action in good condition. FR 4-7546. B

RENTALS OFFERED

APTS, new, Gold Medallion, 1 & 2 bdrm. units, near plant, pool, subterranean parking, patio, private balconies, built-ins, carpets, drapes, radiant heat, July occupancy, unfurn. from \$120 mo.; furn. from \$137.50 mo. 326-0474. E

APT., 1-bdrm., furn., triplex, adults, no pets, 2 blks. from Northrop, lae. closets, aarbaae disposal & aaraae, \$90 mo. OS 5-5407. E

CABIN, Green Valley Lake furn., modern, \$50 wk. DA 4-5961. E

HOUSE, 3-bdrm., fenced yard, paneled living room, disposal, tile kitchen & bath, 1 mile to Northrop, water & trash pd., \$125 mo.; apt., 1-bdrm., unfurn., drapes, carpets, near Northrop, \$80 mo. OS 5-9695. E

ROOM w/bath, furn., private entrance, near La Brea & Slauson, \$14 wk. 295-9997. E

CABIN, Crestline, near Lake Gregory, sleeps 6, 2 baths, June to Sept. \$60 wk. EX 1-2040. E

HOUSE, Lake Arrowhead, 2-bdrm., lae. dorm, sleeps 12, both furn., fireplace, sundeck, patio, lake view, walk to villae, pvt. beach, \$200 wk.; auest house, sleeps 2, \$45 wk. EX 5-6121 days. EX 9-1345 eveninags. E

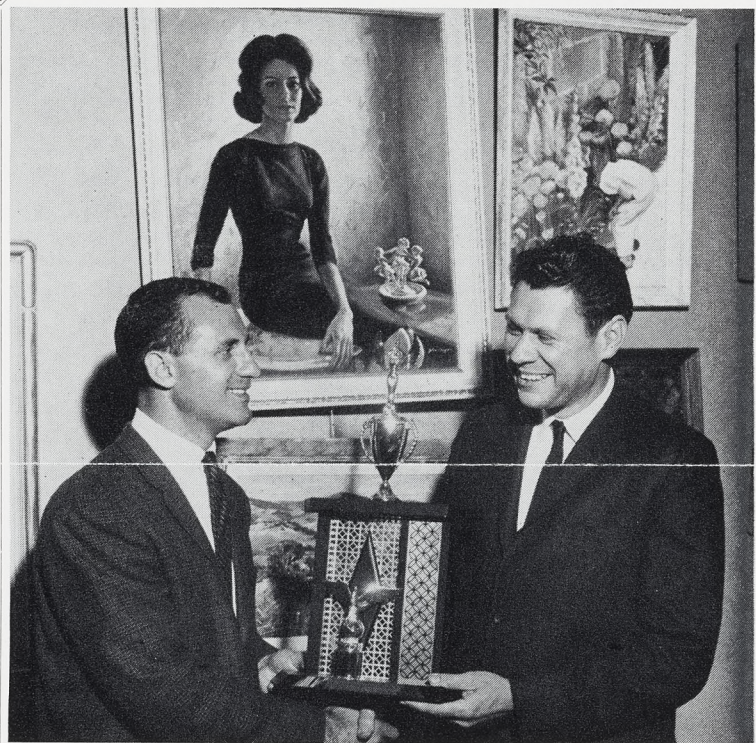
HOUSE, 3-bdrm., close to Northrop, water & trash pd., avail. July 1, \$130 mo. FR 2-7686. E

PERSONALS

WE WISH to extend sincere thanks & appreciation to the NRC, Northrop bloodbank, & our friends for expressions of sympathy during the illness & loss of our father, CHARLOTTE WOOLUMS & FAMILY. L

FOR SALE OR TRADE

FORD, convt., Fairlane 500, 1958, p/s, p/b, auto. trans., good top, \$675 or trade for Volkswaen. SY 8-3002. M



COMMISSIONER KAYSER—Don Greco, Personnel Activities, presents handsome NRC trophy to John Kayser, whose painting "Marge" (background) won art show sweepstakes award. Norair personnel made selection by popular vote.

Craig Wins Circle "R" Golf, San Clemente Next

The NRC Circle "R" golf tournament, held June 22, was won by Mike Craig, with low gross of 78 and Don Sherman, low net 62, it is announced by Mae Hawkins, acting commissioner.

BUY YOUR SEAT BELTS AT P-A, PRICE IS \$3.88

Norair personnel may now purchase automobile seat belts at the Personnel Activities office, Plant One.

The belts cost \$3.88 each and may be self-installed. However, George Nolen, owner, Texaco station, 217 North Prairie Avenue, says bring the belts to him and he will install them for \$1.25, with a lube job, \$1.

These modern lifesavers exceed all SAE, California Highway Patrol and Federal Government specifications, and are available in all popular colors. They are made of pebble grain nylon with metal-to-metal buckles.

First flight went to Joe Had-dad, 68. Second flight was won by Milt Kuska with a 65. Third flight, Tom Stinson, 64. Fourth flight, Henry Johnson with a 64.

Prizes consisted of three golf balls and a trophy for low gross and low net, and four golf balls for flight winners.

The next tournament will be held at the San Clemente Country Club, July 21, tee time 10 a.m. Signup at Personnel Activities begins Monday morning, July 15, and is on first come basis.

Total cost is \$4, including green fees and prize fund.

Buy Savings Bonds

NORTHROP NORAIR NEWS

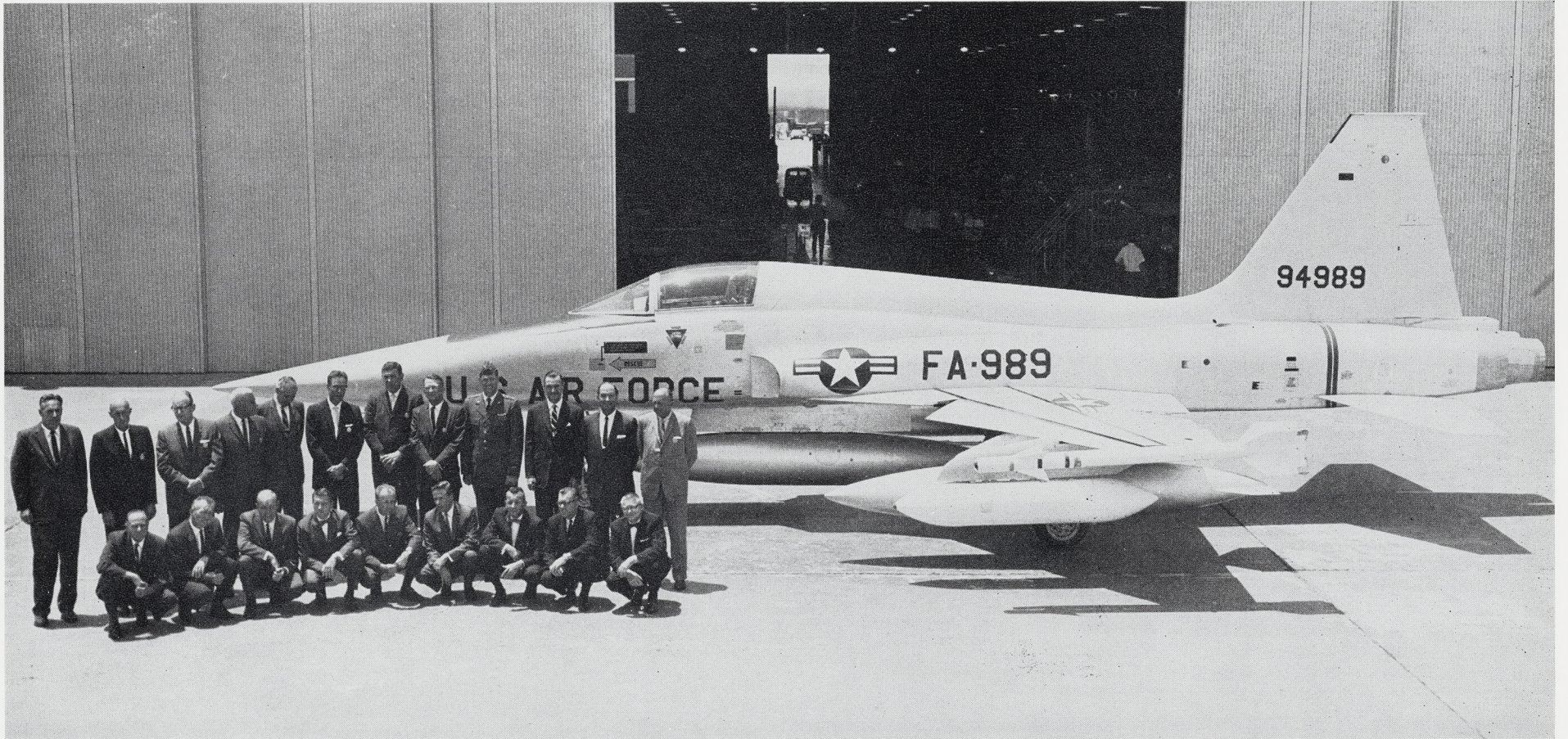
Issued biweekly by Norair Division of Northrop Corporation

• Wednesday, July 17, 1963

HAWTHORNE, EDWARDS AFB, PALMDALE

SAN ANTONIO, EL PASO

The First F-5 Fighter



FOR DELIVERY TO AIR FORCES OF THE FREE WORLD—Northrop's first F-5A supersonic fighter, with stores and armament aboard, moves out flight door at the Advanced Production hangar for transport to Edwards. Company officials and key project men, led by Thomas V. Jones, Northrop Corporation president and chairman of the board, and Dick Nolan, Corporate vice-president and Northrop Norair general manager, on hand to mark the event are from left, standing, Elmer Moore, general supervisor, T-38/F-5 Quality Control; Jack Young, director, Hawthorne Aircraft Inspection section; W. E. Woolwine, manager, T-38/F-5 Program; Dick Beck, director, Manufacturing Engineering; Bob Catlin, manager, Quality Control; Milt Kuska, deputy assistant general manager, Technical; Welko Gasich, vice-president and assistant general manager, Technical; Mr. Nolan; Captain Earl Hallum, A-F Flight Test Management Officer representing Colonel Clark; Mr. Jones; Dr. W. F. Ballhaus, executive vice-president; Robert R. Miller, senior vice-president. Front, from left, Al Carr, superintendent, T-38/F-5 Forward Fuselage, Wing and Aft; Hugo Pink, chief, Flight Test group; Ole Omley, director, Production Operations; Sal Xifo, director, F-5 Program; Jack Mannion, manager, Manufacturing and Materiel; Lew Nelson, director, Test; A. S. Turner, chief tool engineer; Rex Thornhill, superintendent, Advanced Production and Weld group; and Bill Stuart, director, Engineering section.



PREVIEW—First camera look at first F-5A with armament and stores gives strong idea of battle equipment this supersonic fighter will carry into the skies. Crew Chief Milt Rogers and Master Mechanic Harris Stone make final check prior to Company management preview. Airplane will provide free world forces with weapons system which includes air attack, close support, air superiority, and reconnaissance. For details of F-5's Fatigue Certification Program, see Pages 4 and 5.

Strong Performance Ups Sales—To Equal Last Year

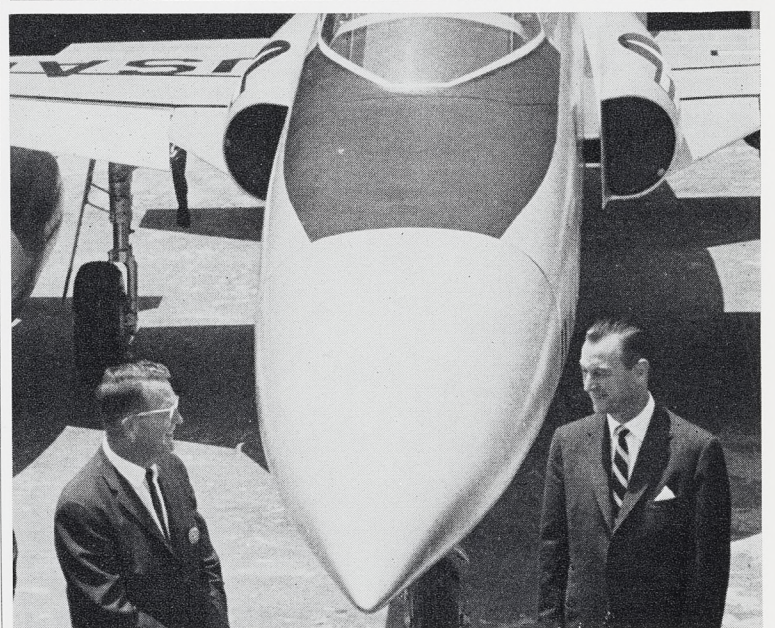
Despite the cancellation of the Skybolt program, sales of Northrop Corporation for the current fiscal year are expected to be up to last year's level, Thomas V. Jones, Northrop's president and chairman of the board, informed members of the New York Society of Security Analysts last week.

"Northrop's sales for the first nine months of our fiscal year amounted to about

\$258,000,000," Mr. Jones said, "and we estimate that for the full 12 months, despite the Skybolt cancellation, our sales will be up to last year's level.

"Our net income for the nine months was \$6,085,000, some \$200,000 less than in the nine months of the preceding year. We estimate that for the full fiscal year we will come very close

(Continued on Page 5)



STREAMLINED AND SUPERSONIC — Mr. Nolan and Mr. Jones are photoed at the streamlined nose of the first F-5A. The airplane is presently planned in two production versions, the F-5A above, a single-seat fighter; and the F-5B, a two-seat fighter or fighter-trainer. Flight test program is now under way at Edwards.

Our Special Way

It has long been the policy of our company to provide us with thoughtfully planned personnel programs, incentives which quite understandably lead toward a more pleasant working environment.

It will be remembered by many, the important step our

By John B. Clark

company took by inaugurating the Northrop NORAIR in-plant charity program in 1954.

Aid United Givers, an organization licensed in 1951 to receive and disburse monies received from AID chapters for charity causes in our communities, was invited to study the Northrop in-plant welfare proposal.



Prior to that time funds were made available under what was known as the Los Angeles County pool formula. In reviewing this method it did not seem equitably fitting for our personnel, particularly those in our outlying facilities to be contributing to Aid United Givers and have their contributions distributed only in Los Angeles County. The Northrop formula specified the number of people working for Northrop and provided a further breakdown indicating the towns,

charitable corporation known as NORAIR.

Approval was granted by the State, followed by an "A OK" from the Federal Internal Revenue Department. Northrop then became an employees' chapter of Aid United Givers, one of the then 975. Today, there exists 2177.

NORAIR, as a corporation, has its capable elected officers and a board of directors consisting of nine qualified members from management level. Working in direct liaison with the board are several NORAIR committees at Northrop facilities. These committees review applications from personnel who, by reason of illness, misfortune, or mishap, find themselves in need of counseling and financial assistance as can best be provided.

Statistically speaking, Northrop personnel from 1955 to 1963, contributed \$1,843,385.16 to Aid United Givers for distribution to the charities. It is impressive to relate that during this period, NORAIR made 1530 grants to individuals totaling \$373,428.

This month a refresher campaign will get under way giving all contributors an opportunity to participate in our dual program and permit those who designate their contributions to a specific cause of their own choosing, the privilege of redesignation, if they so desire. Designations to any cause are applicable for a period of one year

FAMILY DAY

ATTENDANCE: 23,795

communities and counties in which our personnel resided. Aid United Givers accepted our plan and from that time forward, distribution of funds by that organization, made possible by generous employees, has been allocated to the causes in the desired areas.

By September of 1955, we had completed the required articles of incorporation, bylaws, and regulations, that were to be presented to the State of California in applying for approval to form a non-profit, tax exempt

only; hence, the necessity for redesignation annually.

NORAIR, a part of Personnel Activities, Organization 1244, is administered by Mal Mountain and Marie Tully. Both have earned the plaudits of all for their painstaking, conscientious effort to bring our welfare program to a point where it is receiving industry-wide commendation.

NORAIR is our special way of caring.

We take pride in it.

On Time, Never Absent



PERFECT RECORD—Norair's Ken Tary isn't absent today, wasn't tardy either. Furthermore, he hasn't been absent or tardy one day in his 21 years at Northrop. He attributes his perfect record to good health and family teamwork. To this, Ken's fellow workers add job dedication, pride in workmanship and true Norair spirit. He has been in Transportation since first hire, back in 1942. He is now Motor Transportation leadman.



MILESTONE—The 1000th Boeing jet transport aft section has been completed and shipped, a milestone in the Boeing Company subcontract. Contract, started in 1955, is presently scheduled through early 1965, a decade of production service to the 707 and KC-135. The News presents team pictorial commemorating the event. Key men on the project, from left, Fred Walker and M. D. Pedersen, Boeing Quality Control representatives; Guy Kirby, general supervisor, Norair Quality Control; Wendell Howard, contract administrator; Don McCowan, supervisor, Manufacturing Control; Robert Stoll, chief, Scheduling; George Savidan, coordinator, Program Planning; Virgil Grubbs, supervisor, Subcontract Liaison; W. S. Horowitz, stress engineer; L. J. Perry, engineer, Liaison; Elmer Bailey, USAF supervisor; C. J. McGuire, tool engineer; Tom Brazil, general foreman, Aft section; B. A. Muller, supervisor, Tool Engineering; Don Purnell, supervisor, Norair Quality Control; Joe Purvis, supervisor, Planning; and J. J. Fox, tool engineer.

NORAIR PAYS \$1144 AWARD FOR COST REDUCTION IDEA

Chuck Hames, quality mechanic, Metal and Honeycomb Bonding, (recently promoted to section foreman) has been awarded \$1144 for suggesting fiberglass cloth be used in place of silicone rubber to cover metal-to-metal bonded assemblies during the curing operation.

The award ranks high among Northrop Suggestion records being the fourth largest in Company history.

The curing process involves placing the materials to be bonded into a positive pressure autoclave. Pressure action forces the surfaces together, discharging excess adhesive.

Formerly, the process involved covering single stage and first stage metal-to-metal bond assemblies with sheets of silicone rubber to prevent adhesive overflow from adhering to press-to-flow covers, averting damage to the covers and assemblies.

The silicone rubber cost \$17.10 a square yard, and deteriorated after approximately 10 cures. Mr. Hames suggested using pink fiberglass cloth, coated with a release agent in place of the rubber. The glass cloth costs \$1.48 a square yard, a savings of 91 per cent, and is as durable as the rubber sheets.

In addition, the glass cloth eliminates the possibility of insufficient venting due to a sealing action by a nonporous material such as silicone rubber.

Since the Suggestion Awards plan was originated in 1946, there have been only three awards higher than Mr. Hames'. The highest was a \$2000 idea by Larry Wiens and Harold Rutzke, Advanced Production, for using Sta-foam for mockups instead of wood. Robert Warden, Quality Control, suggested a method of saving spars from destructive tests on the T-38 stabilizer which was worth \$1777. Third highest

of \$1388 was awarded to Bruce Blankenship, Manufacturing Control, for a method of checking mismatch orders in Automated Operations Control.

CHANGES CAN BE MADE IN SALARY SAVINGS NOW

The time to change payroll deductions for the Salaried Employees' Savings Plan is now.

Up to August 5, 1963, participants may change the amount of their contribution within a specified minimum and maximum based on their salary in effect May 1, 1963. Also on August 5, changes can be made on the allocation between the Bond Fund and the Stock Fund.

To make changes, a new application card is to be completed and filed with the Personnel office at Plant One in advance of the effective date.

Application cards may be obtained from Personnel, extension 642 or from the Wage and Salary branch office at the Engineering and Science Center, extension 4028.

P-A INSTALLS MUTUAL THEATRE TICKET AGENCY

Mutual Theatre Ticket Agency branch is now open in Personnel Activities office.

Norair personnel are now able to obtain ticket reservations for Southland attractions such as baseball games, ice hockey, basketball, legitimate theatre, big movies, opera, ice follies, special events held at Sports Arena, Coliseum, Hollywood Bowl and Greek Theatre.

To secure tickets for certain events, go to Personnel Activities, look up time, date, place of event, and cost of available seating. Turn in a written application as to first, second and third seating choice.

Tickets will be available on a 24-hour basis, paid for at time they are picked up.

NORTHROP NORAIR NEWS

VOL. 21

NO. 13

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CHARLES BRADFORD, Editor

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—————C. H. Hames, Metal and Honeycomb Bonding, right, wins \$1144 Suggestion Award for substitution of fiberglass cloth for silicone rubber as covering over materials in bonding process. With Mr. Hames, from left, Ole Omley, director, Production Operations; W. F. Geiersbach, foreman, and D. G. Reed, senior foreman, Metal and Honeycomb Bonding. On table, left, parts ready for curing are covered by glass cloth, replacing silicone rubber, right.

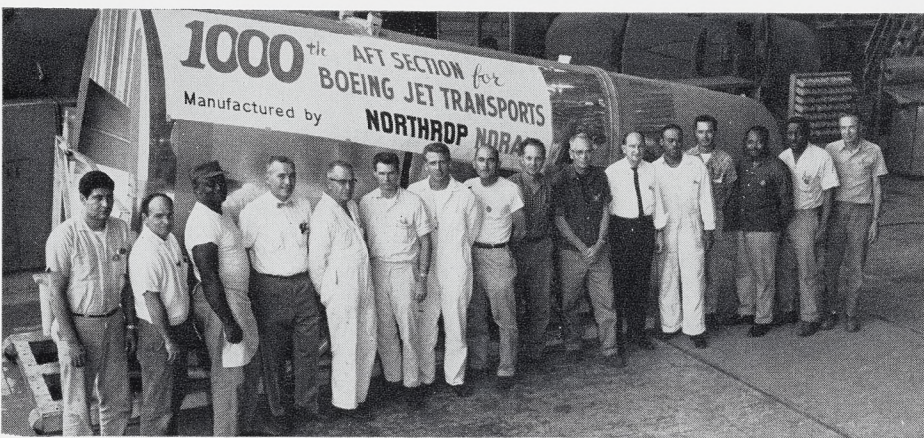


WHALEY'S WONDERS—Group from Tail Cone, from left, Paul Kelly, Don Clarey, Manufacturing Control; Nick Sardegna and Harry Burke, jr., mechanics; Bob Smith, Quality mechanic; Ella Searcy, Lewis Scarborough and Sam Shultz, mechanics; Bob Monteilh, assembler; Leamon Wadley, Quality mechanic; Everett Jones, inspector; Moses Gomes, assembler; Al Whaley, foreman.



SUTHERLAND'S BAND—Team from Final Pickup Line, from left, Gene Beachy, inspector; John Pitiak, mechanic; Ron White, assembler; Alex Fregoso, Quality mechanic; Candy Bernal, mechanic; Francis Todechine and Bob Jackson, assemblers; Charles Kausen, mechanic; Mike Bryant, assembler; Ken Mears, installer trainee; Roy Bishop, inspector; Jerry Sutherland, foreman; Frank Saso, liaison engineer.

BOEING MILESTONE



CLARK'S JET BUILDERS—Men from Aft Final Production Line, from left, Eli Martinez, sealer; Art Fuller, inspector; Napoleon Davis, assembler; Jim Clark, foreman; Fred Justice and Larry Hickman, mechanics; Charles Myers, assembler; Hank Legere and Jake Jacobsen, mechanics; Floyd Loomis, Quality mechanic; John Tye, foreman; Art Davison, assembler; George Baye, inspector; Charlie Jackson and Henry Linton, assemblers; Ray Cook, Quality mechanic.



MCNEIL'S CREW—Torque Box and Subassembly team, from left, Rita Schindler, mechanic; Frank Whitehead and Tom Besheer, assemblers; Dick McGibney, mechanic; Joe Turrieta, assembler; Fred Slover, mechanic; Zina Morris, inspector; Ernie McNeil, foreman; Bob Martinez, assembler; Charlie Emerson, Bill Hunt, jr., and John Dahl, mechanics; Vera Hefferman, assembler; John Pawlicki, Bill Zimmerlin, inspectors; and George Johnston, mechanic.



HOPKINS' HORNETS—Hopkins' group from Drivmatic, from left, Roy Carlson, Quality mechanic; Ellsworth Mechlin, inspector; Dean Lederhos, riveter, Drivmatic; Ray Hansen, mechanic; Herbert Davis, riveter, Drivmatic; Harold Haynie, assembler; Harold Loughridge, riveter, Drivmatic; Dean Wells, installer trainee; Clarence Leftridge, mechanic; Alice McDowell, Hot Dimpling machine operator; Evelyn De Vasher, mechanic; Ralph Romero, Vince Salway, riveters, Drivmatic; and Hoppy Hopkins, foreman.



KEY PERSONNEL—Proud men responsible for helping to guide the progress of 707/KC-135 subcontract are from left, George Reeder, Manufacturing Control; Bob Lieber, general supervisor, Tool Design and Support branch; Elmer Bailey, USAF supervisor; Art Webb, supervisor, Liaison Engineering; Robert Bagby, director, Manufacturing Program Planning; Earl Nickles, superintendent, Subcontract; Bruce Frost, supervisor, Boeing Quality Control; and Jack Young, supervisor, Norair Quality Control.



CRASE'S CRACKERJACKS—Fine group from Bulkheads and Frame Assembly, from left, Theron Hampton, mechanic; Bill Nilges, Quality mechanic; Hayes Maberry, assembler; Al Gullett, Quality mechanic; Isador Blackorby and Frank Garcia, mechanics; Ellsworth Mechlin, inspector; Bob Mosley, Quality mechanic; Frank Gonzales, Helen Oxner, mechanics; Jim Scanlan, installer trainee; Jim Crase, foreman. Northrop Boeing association began over 20 years ago during World War II on the famous Flying Fortress.



ADER'S PERSUADERS—Bob Ader's group from Main Assembly Jigs, from left, Jerrell Stephens, mechanic; Joe Tomsco, Quality mechanic; Frank Ruiz, assembler; Chet Kennedy and Oatis Thompson, mechanics; Cleo Adams, assembler; James Hardaway, Gabby Yaris and Isaac Langley, mechanics; Jim White, Quality mechanic; Madelyne Cristelli, shop clerk; Tex Martin and Yook Low, mechanics; Roman Martinez, assembler; Bob Padelford, Bill Lucas, mechanics; Mr. Ader, foreman, Gene Beachy, insp. Back, Oakie Graves, Harold Odell, mechanics.

Fatigue Certification Programmed For F-5

The supersonic F-5 fighter, being produced at Northrop Norair for delivery to air forces of the free world, is to embark on a Fatigue Certification Program that will take the rugged little airplane through a simulated operational lifetime of hard combat conditions. Goal is 8000 hours of simulated flight conditions and 8000 landings which is twice the normal operational life of the system as anticipated by the United States Air Force and the MAP users.

Design and structural integrity of the wings and other major component parts must prove their worth beyond any doubt. This includes conditions to be met in violent maneuvers and low level aerobatics.

Aircraft configurations will include various armament loadings. Fuel stores, pylons and bomb racks, will be exposed to realistic fatigue conditions to be met by the airplane in its exacting global task.

HEART OF THE SYSTEM

Mechanical heart of Norair's new F-5 fatigue test facility is the new 20-channel load programmer, conceived, designed and developed by Engineer W. L. Worthington, Engineering Laboratories group.

A state-of-the-art extension over the present eight-channel load programmer being used on the T-38, the F-5 facility will increase capacity and flexibility and provide more complete fatigue testing.

Constructed on the building block concept and suitable for a wide variety of fatigue test assignments on other aerospace vehicles, the F-5 fatigue equipment is based on experience gained in the T-38 program where over 11,000 hours of simulated flight conditions have been recorded to date.

The programmer, considered unique in its field because of its ability to simulate unsymmetric conditions, consists of independent load-sensing servo-systems, each of which can be programmed to independently handle 3 modes of operation.

In a typical test, such as the simulation of an aircraft making a landing approach in a crosswind, loads can be applied to each wing, aileron and flap as well as the speed brake and landing gear.

OTHER FEATURES

Other significant features of the programmer include:

1. Actuators are controlled by electro-hydraulic, pressure-controlled servo-valves.
2. In repeating a set of flight conditions, inputs can be programmed to within two per cent of previous settings.
3. Static or dynamic loads may be programmed for each of the 3 modes of operation in each channel.
4. Both the number (1 to 10,000) and frequency (1/10th cps to 2 cps) of the cycling can be preset for each of the conditions.

Building of the fatigue test facility provided an excellent measure of the capability of personnel in the Engineering Laboratories, judged both from the concept and design work of the

programmer as performed by Mr. Worthington, and its actual construction and assembly by experimental electrical fabrication personnel, Phil Hartman, foreman. The marriage of the programmer to the test specimen through a servo load-sensing system will be accomplished under the guidance of Frank Grabowy and Don Atmur, Structures Test.

SOLID STATE

The Lab scored notable technological advances by making maximum use of solid state elements which provide compactness coupled with greater reliability. To offset the cost of the solid state devices, value engineering techniques were used to lower fabrication costs. Programmer switches provide a graphic example. By the use of a newly developed switch in the counter preset selector, solder connections were reduced from 4200 in the original design to 160.

Additional construction benefits were realized by the use of preprinted computer-type logic and sequence boards and other interchangeable components thereby providing the utmost in productivity and duplication of subassemblies.

The two-airplane program will serve another purpose, that of providing the Air Force with additional fatigue test experience for future vehicles.

Fatigue tests will be conducted by the Engineering Laboratories group, Royal Jackman, chief. C. J. Gordinier, supervisor, Structural Laboratory branch and Mr. Grabowy, lead engineer, will be in charge of cyclic testing of full scale test specimens.

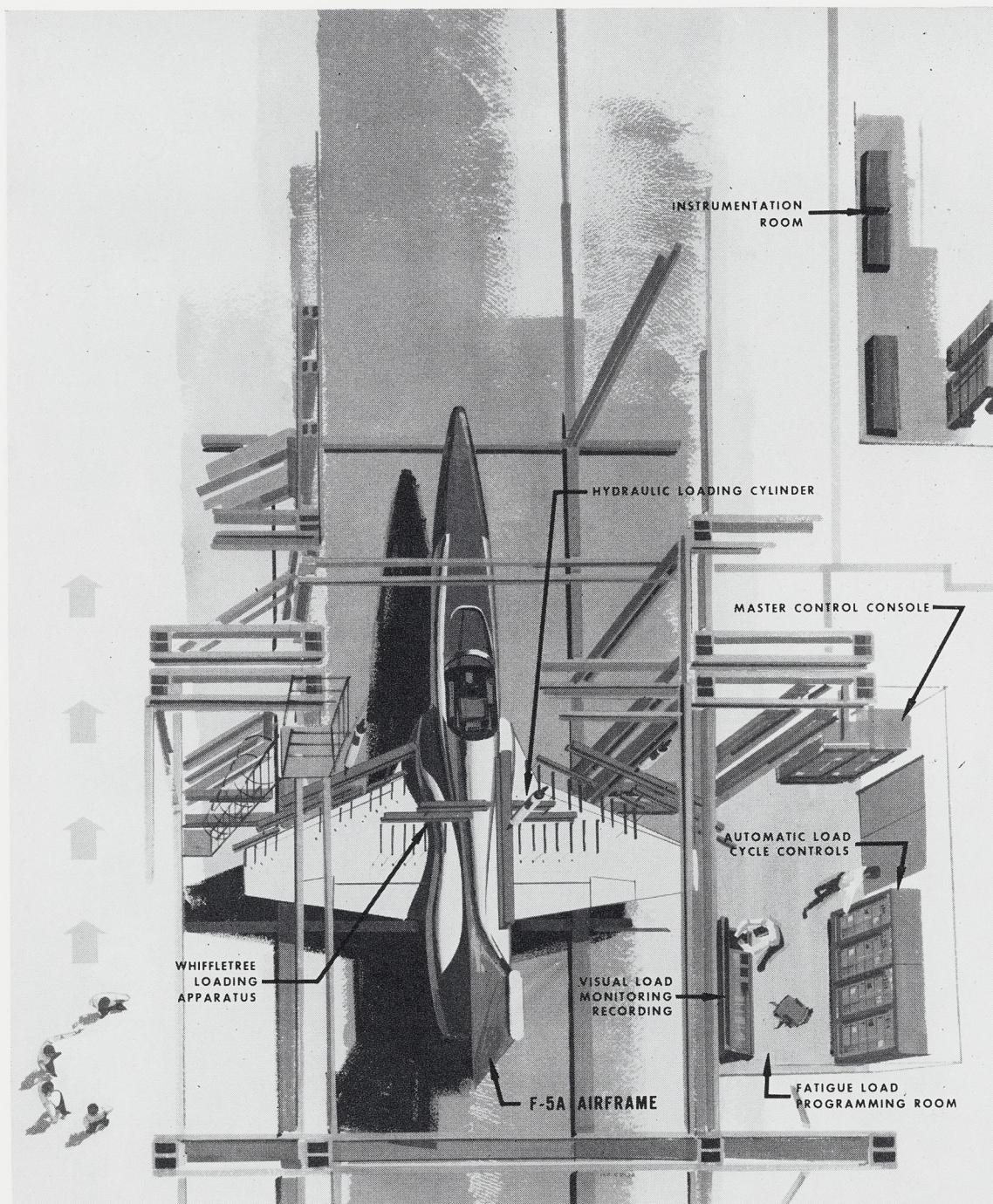
The test requirements for the F-5A Fatigue Certification Program is furnished by the Structural Analysis branch of Technical's Structural and Mechanical Systems group, Lowell Yancey, chief. Stan Murnane is supervisor of Structural Analysis branch. Coordination of the program will be handled by R. D. McClelland, senior engineer. Their computed loads will be verified by flight tests to obtain taxi, takeoff, maneuver, gust, and landing load responses. S. E. Seawell, general supervisor of Instrumentation, and J. O. Barrett, senior engineer, are responsible for the flight test instrumentation and data reduction.

BEGIN IN DECEMBER

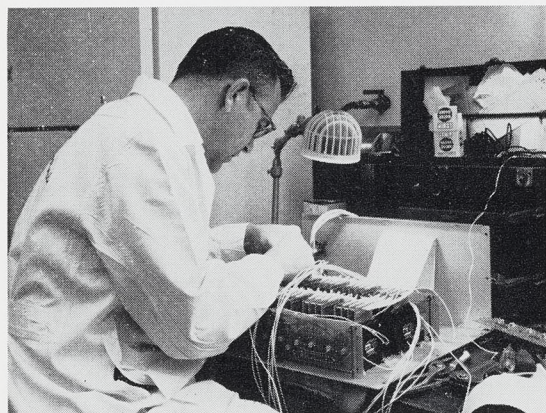
Tests in the fatigue test facility are due to begin in December. The first major component will be the main landing gear. The nose landing gear with an F-5B forward fuselage is to follow shortly thereafter. The program will hit full stride right after the first of the year.

Simulation of maneuver loads, gust, store ejection forces and landing loads on a complete production F-5 wing will commence in February 1964. It is anticipated that approximately 24 months of cyclic loading will be required to completely demonstrate the fatigue integrity of the F-5A and F-5B airplanes.

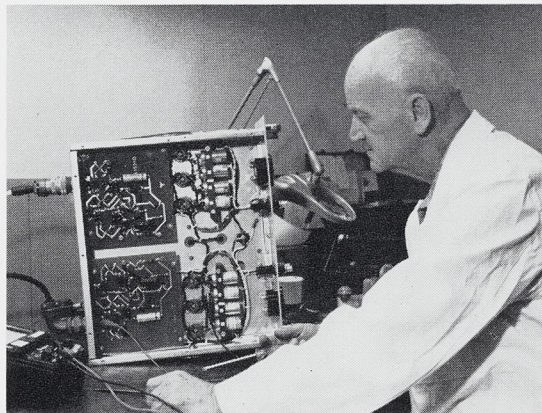
The program will utilize to a maximum extent all data from the T-38 Fatigue Certification Program which is usable in the F-5 program in order to minimize costs.



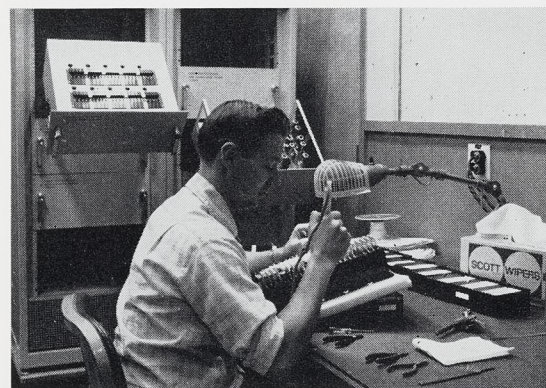
FOR THE F-5 FIGHTER—Artist's drawing shows features of Norair's new facility for F-5 fatigue tests and certification. Location is high bay area in Crenshaw plant. First parts to be programmed will be the left main landing gear and the F-5B nose landing gear and forward fuselage. Program will start in December, hit full stride right after the first of the year. See story for complete details.



PRESET SELECTOR — Here Don Kiltz, Development Lab technician assembles counter preset selector, a device by which test engineers dial in number of cycles required for a particular test. At end of run, test will automatically stop or if programmed proceed to next load condition to be tested.



POWER SUPPLY—Here Development Lab technician Wally Plaskett checks out one of the ± 300 volt, 750 milliamp regulated power supplies. This, as with the entire system, is Norair concept and design. Precision feature is that in repeating flight conditions, inputs can be set to within two per cent of previous run.



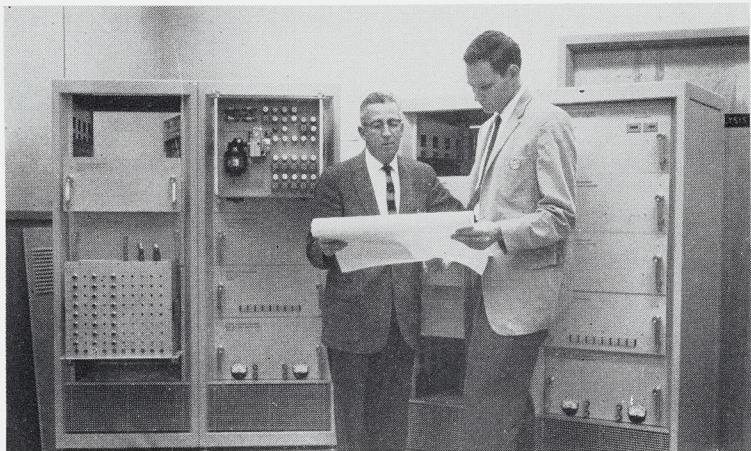
ANOTHER VIEW — Assembling components of counter preset selector is Durand Russell, Engineering Test Lab technician. Note console easy access features as shown left, background. Building of the Norair load programmer demonstrated high degree of capability possessed by Northrop Norair Engineering Laboratories personnel.



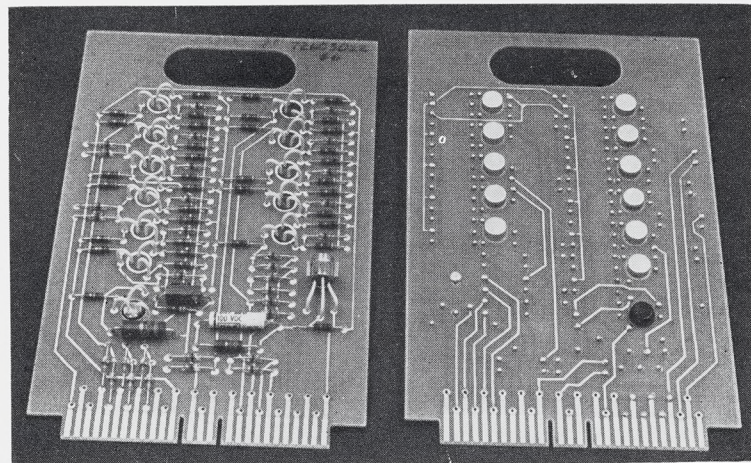
ASSEMBLY OF LOGIC CIRCUITS—Photo shows Development Lab technician Russ Monsch installing sequence circuitry in logic boards which form part of the electronic network to provide automatic sequencing and progression. Another feature, one of many built into the programmer, is its electronic capability to simulate unsymmetric conditions.



CERTIFICATION PROGRAM CONFERENCE—Key men on F-5 Fatigue Certification Program map plans for tests that during the next two years will take the fighter through 8000 simulated flight hours and 8000 takeoffs and landings. From left around the table, Stan Murnane, supervisor, Structural Analysis branch. From Flight Test, R. N. Lanham, instrumentation engineer and R. N. Oliver, data analyst. From Engineering Laboratories, F. A. Grabowy, lead engineer and Carl Gordinier, supervisor; Dave McClelland, senior engineer, Structural Analysis.



DESIGN AND DEVELOPMENT—Engineering Laboratories' engineer, W. L. Worthington, right, who conceived, designed and developed the new programmer, and Al Johnson, research assistant and team leader, confer during assembly and checkout. Tests can be programmed to run automatically and in almost unlimited combinations of cycles and sequences. Once scheduled loads are "dialed in", engineers and technicians need only be in attendance for monitoring and for safety.



LOGIC BOARDS—Use of preprinted computer-type logic network cards scored high in reliability through easy duplication of the redundant circuitry used throughout equipment sequencing, fail safing and memory.

Strong Performance

(Continued from Page 1)
to last year's net earnings."

Northrop sales last year were \$348,279,000, and net earnings were \$9,051,000.

Mr. Jones indicated that Northrop's sales in fiscal 1964 are expected to be higher than in the current fiscal year.

"As the Skybolt experience illustrated, we are not dependent on any single program. Despite their importance and growth, our aircraft programs represent about 25 per cent of our total volume. The largest single category of our business is electronics. Our wholly-owned subsidiary, Page Communications Engineers, has quietly doubled its volume since we acquired it in 1959, and it continues to grow.

Our foreign business is on the increase," Mr. Jones said.

Mr. Jones told the Society that the T-38, in a major continuing program, is being turned out currently for the U.S. Air Force at a rate of 12 a month, and that production has started on the F-5A fighter which will be delivered to the Defense Department for distribution to allied countries under the Military Assistance Program. Present plans call for building up production to a combined rate of 24 airplanes a month. He also revealed that some F-5s will be produced in a two-place version known as the F-5B, a two-place fighter or a fighter-trainer.

In referring to Norair's twin assembly lines, Mr. Jones said,

Millikan Wins High Honor For ANG Work

W. W. "Millie" Millikan, senior Northrop Norair representative in Washington, D.C., is one of five Americans selected to receive 1962 awards from the Federation Aeronautique Internationale at its general conference in Mexico City, October 12-21.

Mr. Millikan will be presented the F. A. I. Paul Tissandier Diploma, awarded for outstanding service to aviation. Similar awards will be presented to Mrs. Grace M. Harris of the Aero Club of Kansas City, Missouri, and Philip S. Hopkins, director of the National Air Museum in Washington, D.C.

Other Americans to receive F.A.I. awards include Paul F. Bikle, director, NASA Flight Research Center at Edwards Air Force Base, and Donald L. Piccard, Raven Industries, Sioux City, Iowa.

Two of Russia's cosmonauts, A. Nikolaev and P. Popovich, will be cited by F.A.I. for their twin orbital space flights last year. Internationale awards will also go to Colonel A. Mantelli of Italy and Gilbert Salomon of France.

Mr. Millikan is a brigadier general in the Air National Guard and is commander of the 113th Tactical Fighter Wing, stationed at Andrews Air Force Base, near Washington, D.C.

Mr. Millikan is credited with exposing thousands of adults and youth to aviation through open house tours of his Air National Guard installation.

He set a transcontinental speed record between Los Angeles and New York City in 1954, flying an F-86F jet fighter.

"In manufacture of these airplanes we have what is probably the most modern aircraft production line in the United States and in terms of numbers of aircraft it is certainly one of the largest production lines in the country."

This was the third time since 1959 Mr. Jones has addressed the New York Society of Security Analysts. Many of the nation's best known financial analysts are members of the Society.

Cafeteria to Serve as Art Gallery for Fine Paintings

As a result of high interest and the enthusiastic response shown by Norair personnel to the recent NRC Art Club exhibit, Norair Division made arrangements last week with the Florence Gardner studio, Culver City, to present a continuous display of paintings and reproductions in the Plant One cafeteria, it has been jointly announced by Fred Wolfe, chief, Food Services, and Dick Pryor, supervisor, Personnel Activities.

First pictures will be shown beginning July 29. And these pictures will be for sale. They will be available to Northrop personnel at moderate prices, and may be purchased either outright or on an extended payment plan, not payroll deduction, however. Transactions will be handled through Personnel Activities.

Norair personnel, particularly NRC Art Club members, John Kayser, commissioner, will also be afforded the opportunity to hang and market their work in the same setting.

In commenting on the exhibit, Commissioner Kayser stated, "An exhibit such as this will give Northrop personnel an opportunity to view and/or purchase some of the finest and most famous paintings in existence, both originals and reprints. In addition, some very good NRC Art Club professional work will get well-

deserved exposure and find possible buyers.

"The cafeteria art gallery plan is a fine cultural service, both for the viewer and artist.

"The fact that many originals will be up for sale, makes it all the more attractive."

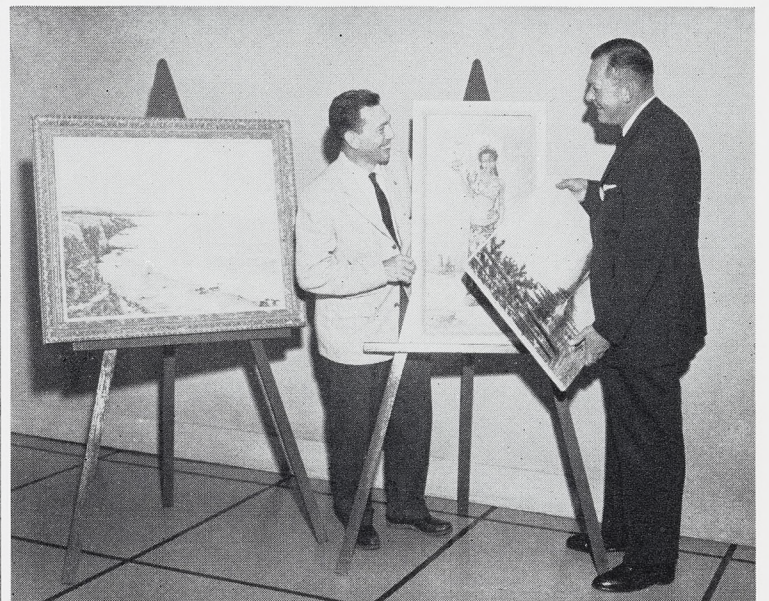
The Gardner paintings and Art Club productions will be selected primarily for their appropriateness as home or office decorations, and will be painted in the various art forms, such as modern, contemporary, realistic or classical.

The display will be changed each six to eight weeks.

Featured first by the Florence Gardner studio will be an original oil by the Italian artist Welters, who is well known for his seascapes. Hanging next to it will be a reproduction of another of his works for direct comparison. The trademark of this particular artist is his ability to capture the translucent effect of light coming through a breaking wave.

Texture and technique advancements made in the process of reproducing originals will also be illustrated by the showing of a reprinted Welters' original.

For further information about the upcoming Norair cafeteria display, phone Don Kohler, Personnel Activities, extension 2784.



ART EXHIBIT — Final plans for layout of paintings in cafeteria art exhibit are being made by Don Kohler (right), Personnel Activities, and Henry Olivier, Florence Gardner art studio representative. Pictured are examples of paintings scheduled to be hung. NRC Art Club productions will also appear in displays which begin July 29 in Plant One cafeteria.

Van Every Appointed To Technical Committee

Kermit Van Every, Norair technical assistant to the vice-president, Technical, has been named a member of the American Institute of Aeronautics and Astronautics Technical Com-

mittee on aircraft design.

Mr. Van Every's appointment was made by the board of directors of the Institute, W. H. Piccard, president.

The AIAA Technical Committee on aircraft design is chair-manned by Conrad A. Lau who placed Mr. Van Every's name on the list of nominations.

Other members, 17 in all, include officials from NASA's Langley Research Center, Boeing, Lockheed, Office of the Secretary of Defense, the Pentagon; Bureau of Naval Weapons, American Airlines, Grumman Aircraft.

Term of office is for one year and members may be reappointed for not more than three years of consecutive service.

NRC OFFICIALS FOR 1963-64

NRC officials as elected for the year 1963-64:

President, Bernie Doyle.
Vice-president, Dave Carney.
Secretary, Dorothy Walls.
Treasurer, Jack Wilson.
Sergeant-at-Arms, Paul White.

The election was held Saturday night, July 13.



RIDES WANTED

7:30 a.m. — 4:15 p.m.

SEPULVEDA & IMPERIAL, El Segundo.
Susan Olson, ext. 1948. 3LA BREA DRIVE & LARCH, Inglewood.
Dorothy Minnick, ext. 1915 674-1059. 3

8 a.m. — 4:45 p.m.

CRENSHAW & ROSECRANS, Gardena.
Need ride after work to Rosecrans.
Linda Bendowski, ext. 688. 5

4:15 p.m. — 12:45 a.m.

IMPERIAL & CRENSHAW, Inglewood.
Need ride to work. Bonnie Carnesi.
ext. 4044, PL 6-8482. 10

BBSF Classified Ads

BBSF classified ad service is provided free of charge to all Northrop Norair personnel.

Ads for agencies, commercial enterprises and private businesses are not accepted.

Deadline is noon Wednesday, one week before publication.

FOR SALE

TRAVEL TRAILER, 1959 model Midway, 20' custom-built, fully self-contained, at Desert Hot Springs Trailer Park, rent paid through Nov., \$1475. 377-6622 evenings or weekends. A

SWIMMING POOL, 12,000 gal. Doughboy, w/filter, skimmer, vacuum cleaner, ladder, testing kit, etc., cost \$500, \$175. 378-1038. A

COFFEE TABLE, \$15; lamp table, \$5; chest of drawers, \$15; vanity table w/mirror top & bench, \$20; manale, portable, \$15. VE 7-3671. A

TOYS, chemistry set, film developing set, bowling game, \$12. AX 5-1459. A

CHEVROLET, 1956, 2-toned, runs well, needs some work, \$100 down, \$22 mo., approx. bal. \$180. Box 1301. A

BOAT, 18' Burchcraft, deep water, 45-hp Mercury, elec. starter, steering, bait tank, skis, lae. wheel trailer, \$995. DA 7-0304. A

LOT, 117'x140'. Victor Village residential section, utilities in & paid for, near schools, shopping. Air Force base, 3 mi. from Apple Valley, \$2950. OL 6-6319. A

RIFLES, 250/3000 Savage w/4x scope, \$95; 22 Hornet-Savage w/4x scope, \$65; boat, 16', glass, fully equipped w/b/tank, trailer & 70-hp Mercury, \$1000. TE 1-4586. A

FREEZER, 22 cu. ft. upright, \$225; sofa, 8', \$75; chair & matching ottoman, king size, T-cushioned, \$100; breakfast table, 4 chairs, black wrought iron legs, \$15; refrigerator-freezer, 11 1/2 cu. ft. Frigidaire Cyclomatic, \$85; TV, 21" Hoffman, \$85; baby bed, \$5; nite stand, \$3; baby buggy w/removable body, \$5. FR 5-1865. A

COFFEE TABLE, dark oak, plate glass cover, \$8; tire, 820-15, tube & rim, fits 700-15 tire, \$6; egg crate, 10'x11', green fiberglass cover, 2'x2'-1" x 6" steel bracket, \$25. NE 9-0242. A

POOL FILTER for 18'x36' Doughboy w/2 filters, \$45. 521-6863. A

ACCORDION, Enrico Roselli, 120-bass, 3-chord, full size, w/case & music stand, \$125. 677-8456. A

AIR CONDITIONER, 220-volt Gibson refrigeration unit, 14,500 btu, \$250. CR 4-7996. A

ROTISSERIE BROILER, \$10; bed, maple, \$10; camera, Arax C-3 & flash attachment, \$25; washing machine, Kenmore, \$15. EA 2-5136. A

REFRIGERATOR, Servel, large, 2-dr., \$100; Hide-a-Bed, king size, Lawson style, \$100. 674-4037. A

MERCURY, Monterey, 1960, 4-dr. h/top, r/h, p/steering, new tires, \$1595; ironer & chair, Kenmore, \$75; TV, 21" Dumont, \$50; bicycle, boy's, 27", 8-spd., \$20. HA 5-3186. A

MATTRESSES, 2, twin size, cost \$69 ea., \$15 ea. 673-1097 evenings. A

SKI BOAT, 16' w/skis, completely fiberglassed, 60-hp Ford V-8 eng., accessories included, \$425. Box 1302. A

BEDROOM SETS, chest-on-chest, 8-drwr. dresser, large mirror, 2 nite stands, dble. bed w/box spring & mattress, solid mahogany, \$300; painted, \$75. OX 2-5860. A

HOUSE, 3-bdrm., extra lae. lot, drapes, w/w carpet, in El Segundo, \$23,500. 322-3862 after 5 p.m. A

STEP TABLE, modern corner-type, walnut w/brass ferrules, \$35. 832-1887. A

HOUSE, 3-bdrm., 1 1/2 baths, carpets, drapes, built-in dual ovens & range, custom designed kitchen, 2 patios, block-walled yard, lots of planters, near Del Amo shopping center, \$23,500. 371-4797 after 6 p.m. A

FOR SALE

OUTBOARD MOTOR, 25-hp Mercury, tank & remote control, \$175. OS 6-3448. A

WELDING & burning equipment, oxygen & acetylene, \$72.50. VE 7-4237. A

DAVENPORT, brown, \$10; ext. table & 4 chairs, natural wood, red leather seats, \$20; dble. bed, springs & mattress, \$35; table small, metal, dropleaf, red formica top, \$5; lawnmower, 21", reel-type, gasoline, \$35. OS 5-1347. A

CHEVROLET, 1951, auto, trans., \$100 or best offer. 327-0662. A

FIRE BRICKS, used, 4¢ ea. PL 4-8142. A

DRESSER, triple, night stand, pewter aray, plastic covered twin bed headboards, knee hole unfinished dressing table, \$75; 6'x9' reed floor mat, red & green plaid, \$10; air cooler w/stand, portable, \$15. TE 3-7621. A

PUPS, mixed breed, med. size, 4-wks-old, \$3. FR 1-8590. A

FORD 6 station wagon, 1954, \$300; bicycles, Schwinn, 10-spd., boy's, \$50; Sears med. weight, \$10. OS 6-0516. A

RADIO EQUIPMENT, amateur-type, SX-99 rcvr., DX-35 xmtr., V.F.O. speaker, Vibroplex bug, D-104 mike, \$175. OS 6-8842. A

RENAULT Gordini, 1962, 4-spd., 40-hp, r/h, w/s/w tires, take over payments & \$200 for equity, \$1200. WH 2-1920. Box 1303. A

LOTS 6, in Inglewood Park Cemetery, Montcrest section, B.C. 366, will sell in 2 3-lot groups, lots of 3, \$2370; 6 lots, \$4140. NE 1-3058 after 4:30 p.m. A

CORNER LOT, over 12,000 sq. ft. in California City, \$300 down, \$30 mo. \$2950. RI 7-8577. A

FORD, 1958 4-dr., remanufactured via V-8 engine, rebuilt auto, trans., \$700; bicycle, Schwinn Superior, 15 spds., \$90; Ford six w/stick, 1959, rebuilt trans., \$800. 371-6775. A

BICYCLES, boy's, 26" hvy. duty, \$20; 24", \$15; motor bike, \$50 or make offer; elec. fan, 18" \$5. PL 5-4497. A

BOAT, 15', Sport Fisherman, controls, 30-hp Johnson, trailer, \$450; maternity clothes, size 10-12, bathing suits, \$3 ea.; capris, \$1 ea.; Bermuda shorts & matching smocks, \$3 set. 371-9730. A

HOUSE, 3-bdrm., carpeting, disposal, water softener, thermostat, fenced yard, view lot, Southwest Torrance, \$2100 down on FHA, \$18,000. FR 5-8278. A

PLAYPEN, maple, \$6; clothesline poles, T-shape, \$1 ea. DA 6-0895. A

MERCURY, 1955 Monterey, h/top, \$450. FR 2-5577. A

TV, 21", maple cabinet w/doors, 2 speakers, \$65. FR 8-5175. A

AMPLIFIERS, Hi-Fi rated, 55 watts, Heathkit model W-7M, completely wired, \$40 ea. HA 5-8578. A

PLYMOUTH, 1953 station wagon, motor & tires good, battery new, \$150. GR 4-4186. A

MOTORCYCLE, 1962 Honda 150, black, \$375. OR 3-0559. A

SWIFT 125, full panel, 27 channel VHF, Omni, recently painted, many extras, \$3000. FR 4-2915. A

DOUBLE BED, mattress & box spring, lamp table, \$55. PL 5-7521. A

PLYMOUTH, Roadster, 1932, P.B. deluxe model, \$395. OS 6-6390. A

HOUSEHOLD GOODS, firm box springs & innerspring mattress, Englander, \$30 for both; chest of drawers, high chest on chest w/8 drwr., drk. finish, \$20; table lamps, 2, white, \$2 ea.; wall lamps, 2, pull down-type, \$3 ea.; quilt, good for cabin or camping, \$3. 327-4087. A

RIFLE, 30-30 Winchester, model 1894, walnut stock, \$65; engine & transmission, 1955 Chrysler, \$150; Ford coupe, 1940, \$50. OS 6-7840. A

DODGE station wagon, 1955, 2-dr., automatic trans., new tires, \$300. OR 0-6896. A

FORD 6, 2-dr., custom 1957, o/drive, radio, seat belts, w/w tires, tinted glass, ammeter & oil pressure gauge, 39,500 miles, \$475. OS 5-6177. A

BICYCLE, boy's 26" Texas Ranger, single spd., \$20 or offer. FR 5-7038. A

OUTBOARD MOTOR, 15-hp Evinrude, \$80. EA 2-5853. A

DRAFTING MACHINE, Bruning, 2700 Equipoise Drafter, \$90. TO 6-6973. A

SURFBOARD, w/balsa wood stringer, 9'7" 23" wide, \$80. PL 4-1715. A

FREE (to be given away)

PUPS, 5, 6-wks-old, 677-1953. D

KITTENS, 8-wks-old, long-haired, black & calico, FR 6-4771. A

RENTALS OFFERED

MOUNTAIN CABIN, 4-bdrm., 1 1/2 baths, furn., 3 miles from Lake Arrowhead Village, for vacationers June-Sept. \$65 week or \$200 mo. DA 4-5774 evenings. E

HOUSE, unfurn., 3-bdrm., 2 baths, built-in range & oven, attached dbl. garage, fenced backyard, in Artesia, \$145 mo. 867-1476. E

DUPLEX, children & pets OK, range & refrigerator avail., lae. fenced yard, Rosecrans near Aviation, \$70 mo. OS 5-1123. E

APTS., 1 & 2 bdrm., carpets, drapes, built-ins, aarb, disp., in Bixby Knoll area, \$100-\$120. DA 3-8956. L

NRC Campers To Hurkey On July 27-28

NRC Camping Club, Max Douglas, commissioner, invites all Norair personnel to attend their next campout at Hurkey Creek, Saturday and Sunday, July 27 and 28.

Hurkey Creek is located eight miles southeast of Idyllwild, on Pine-to-Palms Highway near Lake Hemet.

To get there, go to Riverside, travel Highway 395 to Highway 74, turn left and continue through Hemet and into the mountains. The campsite is on the left and is well marked. A special area has been reserved.

Groceries and other supplies may be purchased at the Mountain Resort Center, four miles from camp.

For an interesting afternoon, Commissioner Douglas suggests a visit to the nearby Indian reservation. A family potluck dinner is also planned for Saturday evening at 5:30.

GADABOUTS MEET TO TALK ABOUT MEXICO TRIP

Howard Cornelius, commissioner, NRC Travel Club, has announced plans to hold a meeting to discuss the Northrop Corporation yearend Christmas vacation trip to Mexico.

The meeting is scheduled for tomorrow night, July 18, 7:30 p.m., at the Parrish House, 120th Street and Prairie.

Those planning to attend are requested to notify Blanche Cook, Personnel Activities, extension 2784.

RENTALS OFFERED

APTS. new, Gold Medallion, 1 & 2 bdrm. units, near plant, pool, subterranean parking, patio, private balconies, built-ins, carpets, drapes, radiant heat, July occupancy, unfurn. from \$120 mo.; furn., from \$137.50 mo. 326-0474. E

HOUSE, 3-bdrm., unfurn., fenced yard, near Northrop, children, no pets \$150 mo.; apt., 1-bdrm., furn., utilities pd., no children, near Northrop, \$90. OS 5-6285. OS 9-3333. E

APT., 2-bdrm., modern w/w carpets, drapes, built-ins, disposal, garage, \$100. 830-1473. E

DUPLEX, deluxe, 3-bdrm., 2-baths., built-in gas range, drapes, garbage disposal, fenced backyard, pool privileges, 1/2 mile from El Camino College, \$150 mo. DA 9-5986 after 4:30 p.m. or weekends. E

APT., 1-bdrm., furn. or unfurn., near Northrop, shopping, transportation, water & trash paid, carports, disposals, \$80. OS 5-9695. E

HOUSE, Lake Arrowhead, 2-bdrm. & large dorm., sleeps 12, walk to village & pvt. beach, 2 baths, patio, sundeck, lae. yard, completely furn., parking \$200 wk.; guest house, same advantages, sleeps 2, \$45 wk. EX 9-1345 evenings. E

CABIN, Crestline, near Lake Greary, sleeps 6, 2 baths, July to Sept., \$60 wk. EX 1-2040. E

SLEEPING ROOM, men only, pvt. shower & entrance, near Northrop, Boy's Market shopping center & transportation, \$45 mo. OS 6-7328. E

CHILD CARE WANTED

LADY to live in, take care of 3 small girls, salary plus room & board, or by day, must have transportation & be reliable. 676-8417. H

PERSONALS

THANKS to the NRC & my wonderful friends at Northrop for the many cards, flowers & visits received during my recent hospital stay. PEGGY PARKS. L

PEOPLE interested in forming airplane pool for computing between Hawthorne airport & San Diego area, Box 1304. L

The Del Camino



READY FOR FUN—Cars line up for turn at slalom course in Eighth Annual Del Camino championship held Sunday, June 30. Event was sanctioned by Southern California Council of Sports Car Clubs, jointly sponsored by NRC Sports Car Club and Union Oil Company of California. Cars ran against electronic timing devices. Les Landstrom is Norair NRC Sports Car Club commissioner.



ON YOUR MARK—"Cars #93 through #100 to starting line-up" blares public address system. Slalom participants competed for championship points awarded annually by SCCSCC plus trophies presented by NRC. Other awards consisted of sports car motor oil, crystal mugs with NRCSCC emblem, and sports car table-racing game.



FAST RUN — Alfa-Romeo in foreground is one third through tough competition. Event was held on Union Oil parking lot, Wilmington. Excellent mechanical condition of entrants is evidenced by the fact that out of 208 applicants, only two cars failed to pass rigid technical inspection due to—you guessed it—lack of safety belts.



PERFECT SAFETY RECORD—Due to rigid safety inspection and safeguard measures taken, perfect safety record was maintained. The day started with breakfast, courtesy of Henry Perren Imported Cars, ended with trophy party at Northrop Norair NRC Clubhouse.

NORTHROP NORAIR NEWS

Issued biweekly by Norair Division of Northrop Corporation

• Wednesday, July 31, 1963

HAWTHORNE, EDWARDS AFB, PALMDALE

SAN ANTONIO, EL PASO

POSEIDON



PROJECT POSEIDON—Northrop Norair was host recently to team associates and U.S. Navy for day-long session of briefings and presentations on Project Poseidon, Northrop concept for Advanced Sea Based Deterrent. Team capability panel during question and answer period, from left, R. E. Ringle, Nortronics; Leon Danforth, Norair; Dr. L. L. Weil, United Technology Center; Captain Allan G. Schnable, Bethlehem Shipbuilding; R. G. Longaker, panel chairman, Norair; J. E. Haney, Norair; Dr. O. H. Griffith, Nortronics; Jim Smith, SSD, Nortronics Anaheim; L. C. Cushman, Norair; and just out of photo L. E. Van Houton, Harris Engineering.



DISCUSSION—Here Commander Robert Yerbury, chairman of the Navy contingent, reviews ASBD concepts with Norair's Bob Gates, manager, Marketing, and Welko Gasich, division vice-president and assistant general manager, Technical.



NORTRONICS—U.S. Navy's F. D. Barclay, consultant SRI; Nortronics' Dr. O. H. Griffith, supervisor, Advanced Space Systems; and R. E. Ringle, manager, Marketing. This sea mobile launch systems study is third USN contract extension on the subject for Northrop Norair. Nortronics Division also has been actively engaged in guidance studies utilizing the sea launch concept.

USN PANEL—Navy team panel here ready for questions consisted of (in photo) Commander Yerbury, chairman, Mr. Barclay, and R. A. Blaise, NOTS China Lake, and (not in photo) Bernard Greenberg, and J. H. Reeves, SRI. See story for complete list of participants.



FROM HARRIS—Harris Engineering's L. E. Van Houton, vice-president, represented this internationally known firm, experts in mobile drydocks and marine installations. Other Northrop Poseidon associates are Bethlehem Ship and United Technology Center.



KEY MEN—Poseidon project key men at the meeting, from left, Lou Drazin, Norair senior marketing representative; M. M. Arnold, director, Marketing, UTC; Dick Longaker, Norair chief, Special Projects, Marketing; Captain Allan Schnable, assistant to the vice-president, Bethlehem; D. S. Goalwin, manager, Product Development, UTC; and Dr. L. L. Weil, staff director, Technical to president, UTC.

Family Day Big Success, T-38 Flyby Thrills Crowd

On Family Day, Sunday, July 14, over 23,795 Northrop people, their families and close friends visited Norair Division. They came early, stayed late.

They saw the inner workings of this aerospace establishment complete.

They were welcomed at the main lobby, Plant One,

by Corporation President Thomas V. Jones; Corporate Vice-president and Norair General Manager Dick Nolan, and Norair's Director of Industrial Relations, John B. Clark.

Following the ceremonies, Mr. and Mrs. Jones and their son Peter were among the first groups to start on tour. Daughter Ruthie would have been with them but she was away at summer camp.

Mr. and Mrs. Nolan and family, including grandchildren, were here in force to see the assembly lines and the research laboratories. Son Dick, his wife, Dianne and their son, Richie; daughter Shirley, her husband, John Richman and their son, Billie, made up the party.

And this was the tone of the day for one and all. Moms and dads and juniors. Uncles, aunts, grandparents, and many retired folk. All eager to see the T-38, the F-5, the X-21, and the wind tunnel.

Thousands were waiting at 1 p.m. for the doors to open.

Stragglers were still here at 6 p.m. as Chief Parker's boys closed the gates.

It was a big, big day.

Some vital statistics:

Total estimated distance walked by total Family Day visitors—27,000 miles.

One shoe has been found — a girl's.

(Continued on Page 6)

Northrop and Associates Brief Navy on Poseidon

Northrop Corporation, working with the Navy during the past three years, has been engaged in extensive research studies on the sea launch of missiles. From these studies, the Project Poseidon concept was developed.

Project Poseidon named for the ancient Greek monarch of the seas, who through his power, also controlled the earth, is a Northrop approach to the Navy's Advanced Sea Based Deterrent requirements.

From both an economic and strategic standpoint, Project Poseidon bids to achieve the best cost/effectiveness ratio for flexible response.

Current work is the third funded USN contract extension for Norair dealing with studies of sea mobile launch systems. Nortronics ES&E completed a HYDRA Guidance study during Fiscal 1963.

The Northrop Norair Division hosted the USN Advanced Sea Based Deterrent Panel for a full day conference on Thursday, July 11. The USN panel was composed of Commander Robert Yerbury, chairman; R. A. Blaise, NOTS China Lake; Frank D. Barclay, Bernard Greenberg, and J. H. Reeves, SRI.

Norair and industrial associates in Project Poseidon convened Wednesday, July 10, for preconference discussions.

Associate attendees were:

Nortronics—R. E. Ringle, Marketing manager; Dr. O. H. Griffith, Advanced Space Systems; Robert Hodge, Marketing; Jim Smith, Automatic Test Systems; Howard Sutherland, Marketing; and other technical personnel.

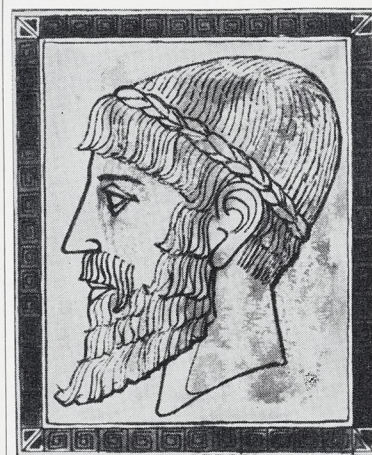
Bethlehem Shipbuilding—Captain A. G. Schnable, USN (ret.), assistant to vice-president, New

York City and John R. George, manager, Weapons System, Quincy, Massachusetts.

United Technology Center—M. M. Arnold, director, Marketing; D. S. Goalwin, manager, Product Development; B. K. Saffery, district manager; and Dr. L. L. Weil, staff director, Technical to president.

Harris Engineering—leading international engineering consultants in the total marine facility field, L. E. Van Houton, vice-president.

USN activity in developing method and basic requirements



POSEIDON

... Through sea power he controlled the earth.

for the next generation major weapon system (following and complementing the FBM system) was fully explained to Northrop and its associates. No final ASBD selection has as yet been made regarding service implementation; work is still in progress.

The Navy briefing to Northrop and guest associates, given during the morning, covered all technological, economic and social considerations attendant with development requirement for a major weapon system—

(Continued on Page 3)

P-A Exclusive "How the West Was Won"

Northrop exclusive!

The Cinerama picture "How the West Was Won" will be shown at an exclusive Northrop Theatre Party, it has been announced by Dick Pryor, general supervisor, Personnel Activities.

The party will be held Saturday, August 17, at the Warner Cinerama Theatre, 6433 Hollywood Blvd., Hollywood. Curtain time at 5 p.m.

Starring roles are portrayed by Carroll Baker, Lee J. Cobb, Henry Fonda, Karl Malden, Gregory Peck, George Peppard, Robert Preston, Debbie Reynolds, James Stewart, Eli Wallach, John Wayne, Richard Widmark and narrated by Spencer Tracy. This epic motion picture was filmed in Technicolor.

Reduced prices for reserved seats are, main floor lodges \$1.80; first balcony, \$1.40; and balcony, \$1.25.

Regular prices would be \$2.25, \$1.75 and \$1.45 respectively.

Tickets may now be purchased at Personnel Activities.



Our Blood Bank—A Life Savings Account

Typical of Northrop and our people is the Welfare group's blood bank program. Over the years, the project has earned the acclaim of the American Red Cross and Company personnel and families who were grateful recipients when serious illness befell.

All of us know of this great humanitarian service but few of us, I am sure, are mindful of the magnitude of the program as it is administered, for example, here at Norair.

As you know, the Northrop blood bank is authorized to provide whole blood and blood derivatives for all personnel, whenever and in whatever quantity may be required. This also extends to the immediate members of their families.

Within the last six months a total of 304 pints of blood were provided for 10 open heart surgeries. Eight of these 10 were Northrop personnel, while two were dependents. A total of 58 pints of blood during this period was provided for cancer patients,

By John B. Clark

while 51 pints were made available to those having leukemia.

Certainly, we should be encouraged to participate in our blood bank, for we never know the day or the hour when the urgent need for blood or derivatives becomes essential to life. And it is now strongly recommended that the invitation to participate should also be extended to the dependents.

We at Norair keep a Central Control of all donations and withdrawals. If the anticipated recipient is not an employee of Northrop (mother-in-law, father-in-law), each request is carefully screened for eligibility.

In the past 13 years, Northrop personnel have contributed 15,956 pints of blood. They have withdrawn 11,085, of course, at

no charge. The minimum price for blood on the "open market" is \$25 a pint; rare types of blood cost as much as \$65 a pint; less rare types cost about \$45 a pint.

This creates a very impressive dollar figure, roughly \$398,900 and, in most cases, Company families would not be able to afford this blood. However, the Northrop blood bank stands behind them and authorizes free withdrawals whether they are or are not a donor. There are many persons who, because of health reasons, can never give blood. It is of prime importance that our reserve is large enough to care for all of ours.

The blood you contribute to the blood bank does much more. You get the traditional protection for yourself and your family. Whole blood in case of surgery, hemorrhage, accident—but there's an extra dividend, blood derivatives.

Plasma — for treatment of shock and burns.

Red cells—treatment of anemia.

Fibrinogen—for use in severe cases of hemorrhage in certain complications of childbirth.

Antihemophilic Plasma — for hemophilia.

Vaccinia Immune Globulin — for smallpox vaccination complications.

Gamma Globulin — to combat measles and hepatitis.

Serum Albumin—treatment of shock and certain liver and kidney diseases.

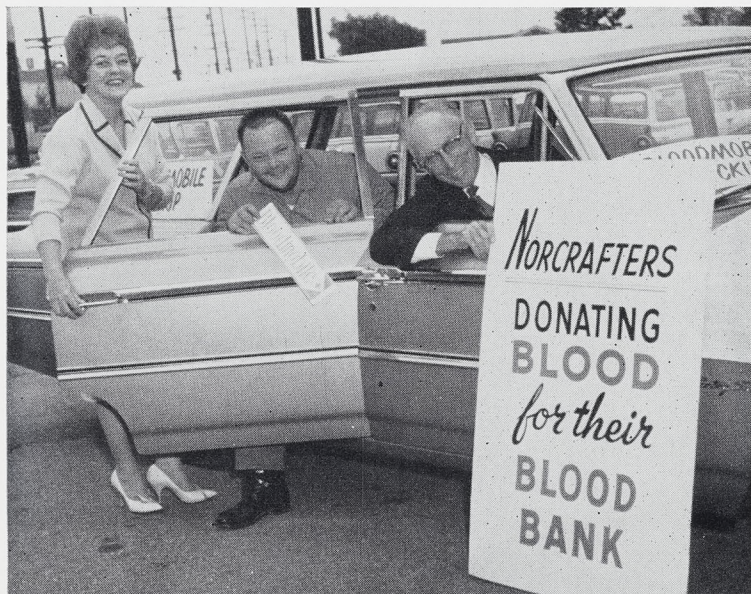
Frozen Plasma—treatment of coagulation defects.

Although it takes several pints of whole blood to produce a single unit of many of these derivatives, our blood bank requires only one blood credit from you for each unit your doctor prescribes.

The next blood bank visit is August 14. Location—NRC Clubhouse. Donor application forms are always available from organization clerks and at Personnel Activities.

We have a date then.

August 14. See you there.



TWO GALLON MAN AND A MAYOR—Marie Tully, Norair's assistant welfare coordinator, gets all-out support for blood bank day, next August 14. Center is a two-gallon donor Jack Yerian, Building Services and Salvage, with Robert Reeves, Hawthorne City Councilman, former mayor of the city and also member of Red Cross Executive Committee and Board of Directors. Mr. Reeves earns plaudits by generously helping with donor transport on Norair blood bank days.

IDI System To Aid A-F Provisioning

Delivered to the customer ahead of schedule.

The first Improved Data Interchange tape for the Air Force's new provisioning spec has been completed and handed to a customer team represented by Major T. S. Bean, jr., deputy Northrop AFPR and John R. Kenney, director, IDI office, Headquarters, Middletown Air Materiel Area.

Norair, selected by the Air Force to provision and support the F-5A and F-5B programs under IDI, has been coordinating and gearing up to this new and modern method for the past several months.

The Division is the first prime contractor to implement IDI but it is anticipated that all contracting agencies awarded contracts by either the Air Force, Army or Navy will soon provision their products through the system.

Improved Data Interchange is a major step toward a total automated reporting method. Procuring and contracting agencies, applying IDI, will work to a standard system whereby data relative to the total provisioning process is exchanged through the media of computer magnetic tapes all of the same format. Each agency may then use their master file to extract varied management reports.

IDI is expected to not only increase the speed of provisioning transactions manifold but to achieve a degree of accuracy never before realized.

Dr. Ballhaus Named Head AUSA Group

Dr. William F. Ballhaus, executive vice-president, Northrop Corporation, is the newly elected president of the Association of the United States Army, Greater Los Angeles Chapter.

Brigadier General George V. Underwood, jr., chief of Information, Department of the Army, was guest speaker at the chapter's annual dinner meeting recently at the Beverly Hilton Hotel, at which Dr. Ballhaus and other new officers were named in proceedings conducted by Major General F. C. Mency, USA (Ret.), chairman of the AUSA chapter board of directors.

W. Gifford Myers, Lockheed Aircraft Corporation vice-president, was elected first vice-president. Other new officers are Charles W. Hutton, Douglas Aircraft Company vice-president, who became second vice-president; Carl D. Perry, Hughes Tool Company Aircraft Division director of Public Relations and Advertising, was named third vice-president, and Lieutenant Colonel Hubert J. Van Kan, Army industrial liaison officer, was elected chapter secretary. Brigadier General J. A. Maxham, USA (Ret.), was re-elected treasurer.

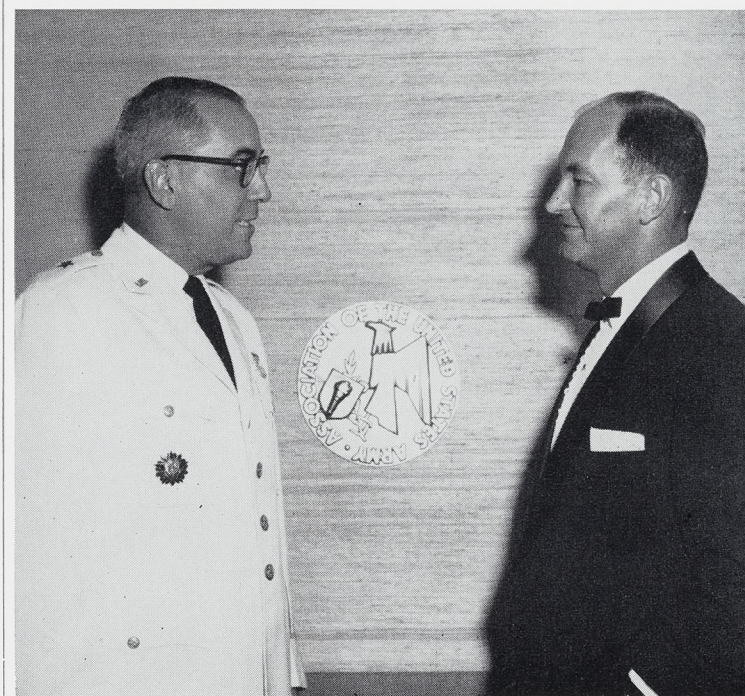


FIRST IDI TAPE—First Norair-generated Improved Data Interchange magnetic provisioning tape is delivered to the Air Force ahead of schedule. Participating in the event are from left, Norair supervisors Charles Merlian, Business Systems; Wiley Clark, Automated Logistics Systems; and Norvel Humphreys, Information Processing Center. Representing the Air Force are Frank G. Twardzik, Digital Computer programmer and John R. Kenney, director, IDI office, Headquarters MAAMA and Major T. S. Bean, jr., deputy Northrop AFPR.

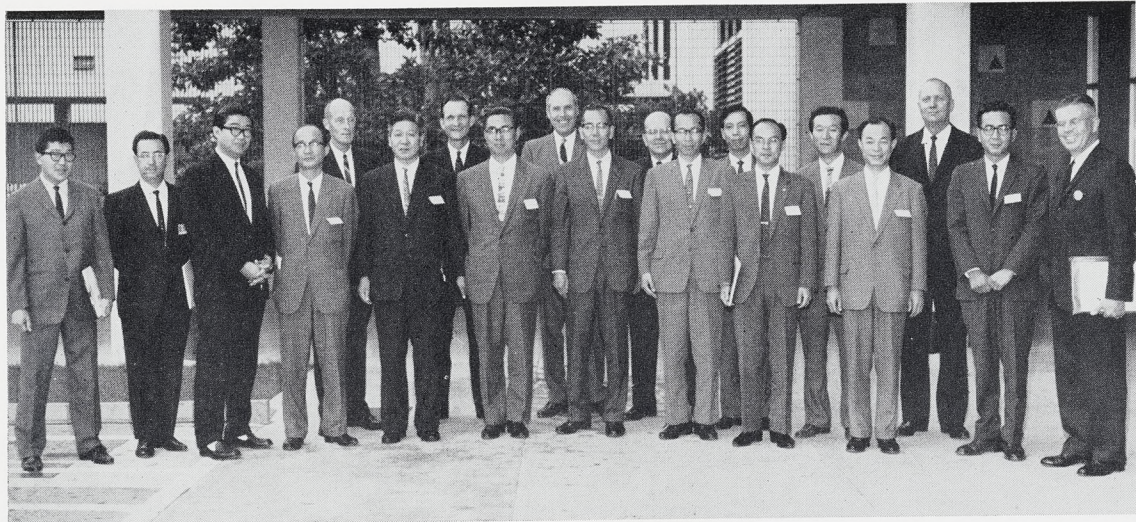
New NRC Officials



ALL VOTES ARE COUNTED—Dave Carney, vice-president, shows President Bernie Doyle and other members of newly elected NRC administration the final vote tally. Election was held at Century Inn, Saturday, July 13. Officers are, from left, Dorothy Walls, secretary; Jack Wilson, treasurer; Bernie Doyle; Paul White, sergeant-at-arms; and Dave Carney.



ELECTED PRESIDENT—Brig. General George V. Underwood, jr., chief of Information, Department of the Army, and Dr. William F. Ballhaus, executive vice-president, Northrop Corporation, discuss objectives of the Association of the United States Army. Dr. Ballhaus is the newly-elected president of the Los Angeles Chapter of AUSA. General Underwood was the principal speaker at the recent annual meeting of the Los Angeles chapter.



VISITORS FROM JAPAN—Quality Control team sponsored by Union of Japanese Scientists and Engineers, on five-week visit to U.S., were recent guests for briefing and tour of Norair Quality Control installations. Left to right, Hiro Yamashita and Russell Black, Northrop interpreters; Yoshio Hori, Fujita Travel Service; Toshikazu Higashino, Sumitomo Electric Industries; Jack Young, director, Hawthorne Aircraft Inspection section; Masao Ikawa, Toyo Rayon Company; Lew Bednarchik, general supervisor, Quality Control; Genzo Morimoto, Sumitomo Bakelite Company; Bob Catlin, manager, Quality Control department; Kaoru Kakuda, Toyo Kogyo Company; Dan O'Halloran, chief inspector; Nagashige Inaba, Teijin, Limited; Junji Noguchi, Planning section, Union of Japanese Scientists and Engineers; Teiji Nagashima, Nippon Seiko Company; Kazuma Yokota, Prince Motors; Kazuo Haruta, Asahi Chemical Industry Company; E. C. Bennett, chief, Quality Control Engineering; Keiji Yura, treasurer, Maruzen Oil; and Roy Wolford, senior engineer, Quality Analysis.



HERE'S HOW IT WORKS—R. E. Young, factory departmental assistant, Standard Tool Maintenance, demonstrates his split-pointing attachment to Winslomatic drill sharpening machine he fabricated. Viewing demonstration are John Oliver, Northrop administrator, Corporate Licensing, and James Winslow, president, Winslow Product Engineering Corporation. Mr. Oliver later presented licensing check to Mr. Young as result of royalties received to date from Winslow's manufacture and marketing of the attachment.

"Lickity Splitter", New Norair Drill Sharpener

A major advance in drill sharpening operations was made recently in Norair's Standard Tool Maintenance by R. E. Young, departmental assistant, which provides a higher degree of efficiency plus better quality and workmanship.

Practice was to first sharpen the drill point on the Winslomatic drill sharpening machine, then in a separate operation, cut the small split-point tip with a bench grinder.

Mr. Young, after a study of the old sharpening method, fabricated an attachment to the Winslomatic which sharpens and split points on the one machine.

It is now possible for two operators to perform both procedures simultaneously and with compatible quality. In the six months it has been used, production has increased fivefold.

The "Lickity Splitter," as Mr. Young's co-workers affectionately call the unit, works off of the lower shoulder of the master grinding wheel, an area previ-

ously unused.

The unit is presently being evaluated for a possible Suggestion Award, and patent application is in progress.

According to James Winslow, president of Winslow Product Engineering Corporation, firm that has already licensed the tool, the "Lickity Splitter" is offered as optional equipment on their machines in manufacture, plus being available as an attachment for those now in use.

Under Northrop's Patent Award Plan, Mr. Young will receive a \$50 award for the patent application, an additional \$50 when the patent is issued, plus royalties for the duration of the licensing contract between Northrop and Winslow.

In commenting on Mr. Young's achievement, Mr. Winslow stated, "America needs creative thinkers like Mr. Young. People who go beyond their job are tremendous assets to industry, and help make our nation strong."

Poseidon

(Continued from Page 1)

from basic material research to psychological constraints. One typical definitive input was the result of an analysis of over 850 technical reports.

The afternoon session consisted of a discussion of the USN-SRI program consultants' material and introduction of the Northrop panel, together with a brief history and related experience presentation from each associate.

The Northrop Project Poseidon film which depicts the Norair employment concept for ASBD was shown. A question and answer discussion of the Norair Project Poseidon concept between the USN and Northrop followed the film.

The panel was composed of:

From Norair: R. G. Longaker, chairman; Lloyd Cushman, Sea Mobile Launch Systems; Leon Danforth, Hydrodynamics; J. E. Haney, Advanced Missile Design.

Nortronics ES&E: Dr. O. H. Griffith, Guidance.

Nortronics SSD: Jim Smith, Automatic Systems Evaluation.

Bethlehem: Captain A. G. Schnable, Shipbuilding and Modification.

Harris Engineering: L. E. Van Houton, Marine Facilities. United Technology Center: Dr. L. L. Weil, Propulsion.

The Project Poseidon concept encompasses the HYDRA launch technique; i.e., missiles free-floating vertically in the sea, as well as several other system attributes developed by the Norair Sea Mobile Launch Systems group during the past three years. The Norair HYDRA/Sea Mobile Launch Systems studies have and are currently addressed to scientific space applications, while Project Poseidon deals with the weapon system only.

NORTHROP NORAIR NEWS

VOL. 21

NO. 14

3901 W. Broadway, Hawthorne, Calif.
A NORTHROP CORPORATION

PUBLICATION
NORAIR DIVISION
Published every other Wednesday

CHARLES BRADFORD, Editor

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On Family Day

Dick Nolan, Corporate vice-president and Norair general manager: "For the Nolans, as I am sure it must have been for many others, Family Day presented a rare opportunity to greet old friends, to see our good products and, in one afternoon, to tour the Division from end to end. My congratulations to the committee and to all others who had a hand in making the arrangements. Their interest and effort and teamwork made the event one of our outstanding successes for 1963. The plant looked wonderful. Good planning was everywhere evident."

Bob Lloyd, Norair vice-president and assistant general manager, Operations: "It was a fine day for all of us who work here, but I thought it was a particularly fine day for the younger generation. My youngsters certainly enjoyed it, asked a million questions. I don't think we have to worry about good people to take our places in the years to come."

Milt Kuska, deputy assistant general manager, Technical: "My son Dave liked the three-axis simulator in the new Research building, and the hypersonic wind tunnel best. I found great interest in the Manufacturing area such as Gaiennie's shop and the numerical control section."

John B. Clark, director, Industrial Relations: "This Family Day, as with those in the past, will provide a Norair highlight for years to come. It was extremely gratifying to see so many fine families, healthy children, eager-to-learn teenagers. I think the big moments during the day were when Mr. Nolan and Mr. Jones extended their personal welcome, and when our beautiful T-38 flew over the field."

Paul Wierk, director, Administration, Technical and Family Day co-chairman: "A big thanks to the Family Day committee and hosts. Their congenial attitude and willingness to explain plant operations added immeasurably to the success of Family Day."

John Breneman, manager, night Operations and Family Day co-chairman: "I too vote a big hand for committee members and all the hosts. Their organization, long hours of preparation and their good help while the visitors were here, paid off handsomely. The main purpose of Family Day was certainly achieved. Now when dad or mom comes home and talks about the assembly lines or the Science Center everybody will be able to proudly join in because they were there and saw it all Sunday, July 14."

Bob Catlin, manager, Quality Control, a 24-year man and fourth oldest Northrop man in years served: "During the first Family Day at Northrop, it took just a few minutes to tour the facility. That was way back when. This time the tour took three hours. But people haven't changed. Only industry has changed, grown bigger. It is the same thrill now for the wife and young ones to see where daddy works as it was then. I like family days and this was the best yet."

Ernest Romero, aircraft structures assembler, 5758: "My kids were impressed. I showed them a T-38 on the assembly line where I work. Believe me they were really impressed when I told them I helped build it."

Mel Overton, stretch wrap forming machine operator, 5503, demonstrated Hufford stretch press for Family Day: "The 'Eight-Fifteen' was the star of the show. There were thousands of questions from visitors who passed by. At first I was a little nervous, but after seeing and talking with such a friendly crowd, it became a real pleasure to demonstrate this big bender."

And a letter from a wife:

Northrop Norair Division
Dear Sirs:

On Sunday, July 14, I had the pleasure of attending Northrop Family Day. I was very impressed with the facilities that I saw and especially with the courtesy of the people in charge who answered the innumerable questions.

The high spot of the day for me was, I confess, the fly-over of the T-38. A truly magnificent machine both in performance and sheer beauty of functional line.

I would like to say thank you for an interesting day.

Sincerely,

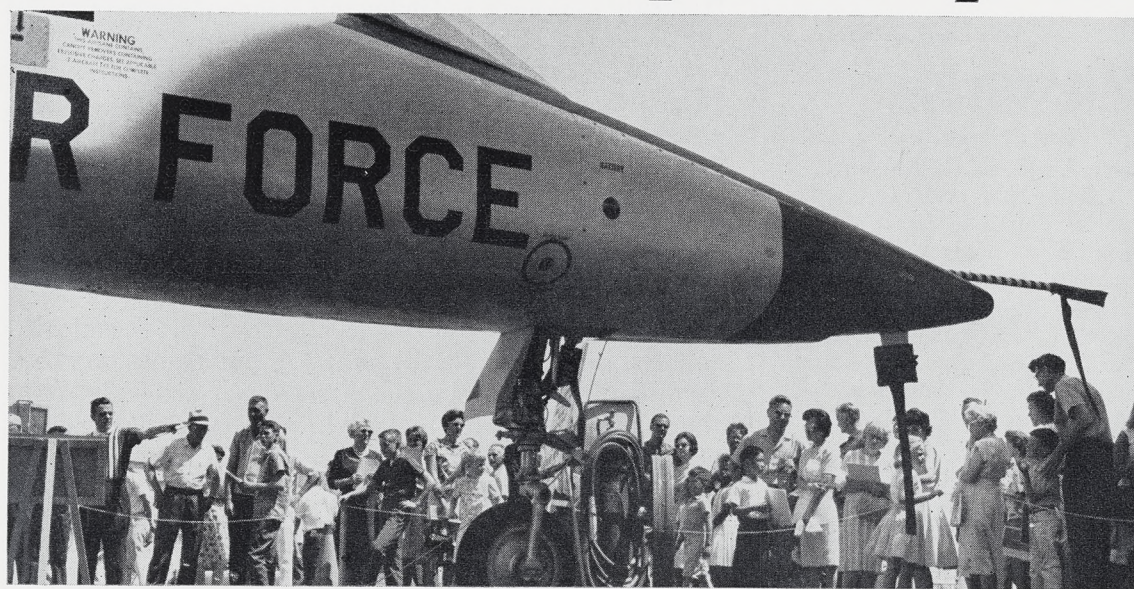
Mrs. Irene Corsi

(Mr. Corsi works in Laboratory Operations, 3931.)

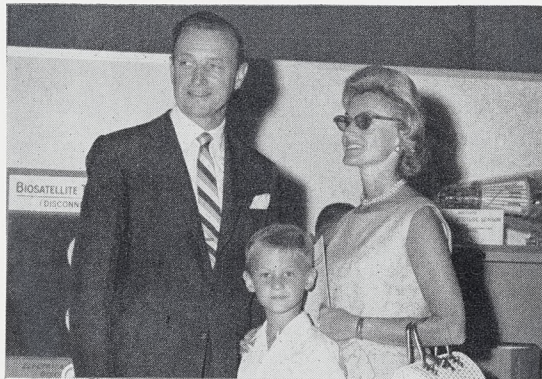


PLANT ONE LOBBY DOORS OPEN AT 1 P.M. TO ADMIT FAMILY DAY CROWD OF OVER 23,795.

Family Day Pictorial



THE T-38 SUPERSONIC TRAINER—Airplane, down from Edwards, played to record crowd all day long. A sister ship flew overhead on hourly intervals. Location of photo is east end of new assembly building. Note a dad, at left, presumably pointing out landing gear feature to son—perhaps, who must be behind the A-frame sign.



ON TOUR—Mr. and Mrs. Jones and son Peter are photoed during the afternoon as they reach Northrop Space Laboratories. Entire route was estimated at over a mile. Cafeteria and free refreshments were half way. Highlight of the day was T-38 flyby. There were many compliments on courtesy of hosts, on good housekeeping throughout.



MEDALLION PLACE—Bob Lloyd, vice-president and assistant general manager, Operations; son Randy, edge of table; daughter Lori, plaid dress, on Mr. Lloyd's right; Mrs. Lloyd, print dress, partially hidden. Handing out medallion key chains, commemorating Family Day are from left, Pat Anderson, 5503, and Irene Smith, 5501.



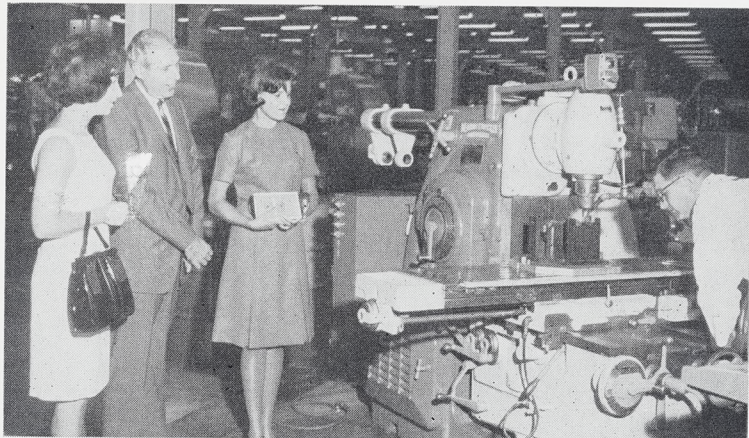
IN FAB AREA—Mr. Nolan, by timecard rack; son Dick; grandson Richie (riding); grandson Billie, light suit; daughter-in-law Dianne, polka dot dress; Mrs. Nolan, with glasses; son-in-law John Richman, on Mrs. Nolan's left; daughter Shirley, hidden.



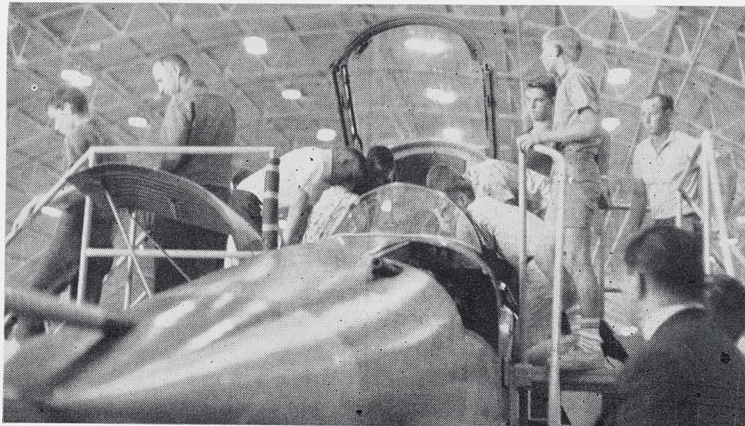
ON THE NUMISMATIC SIDE—Committee Co-chairmen Paul Wierk and John Breneman, left, present Ed Bentley, NRC Coin Club commissioner with special medallion marking Norair Family Day, 1963. NRC displays in cafeteria were a high interest point for everyone.



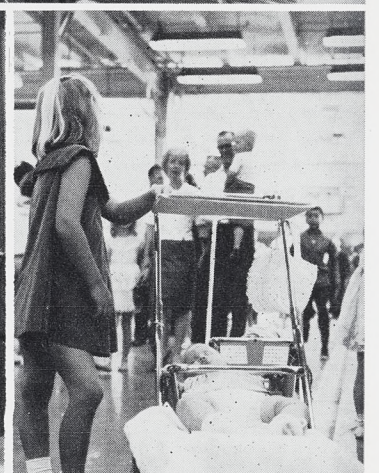
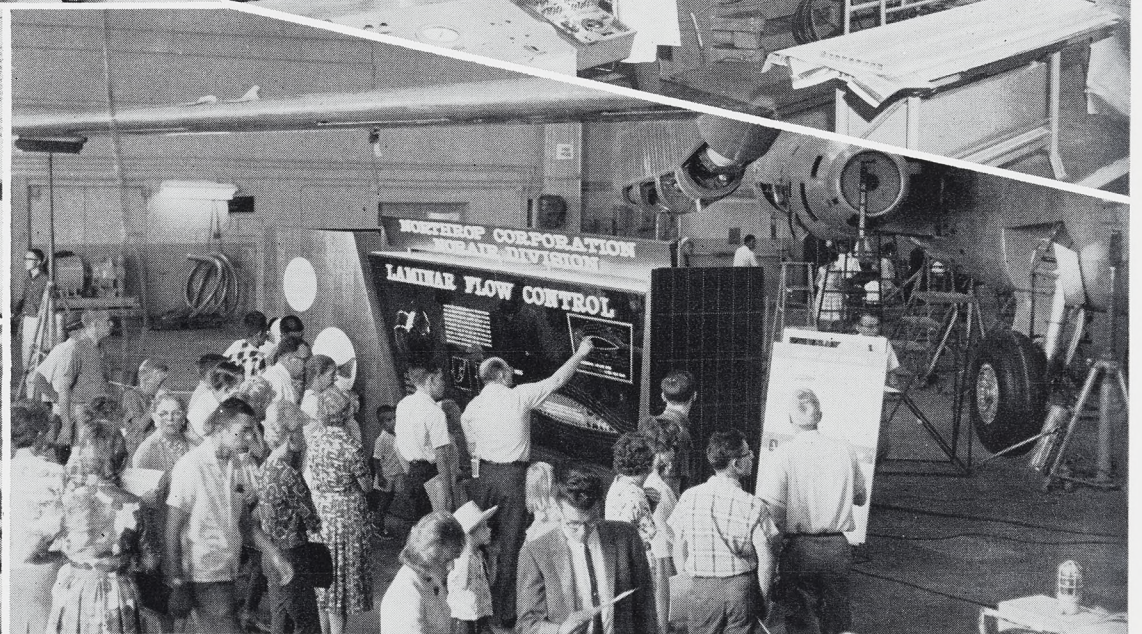
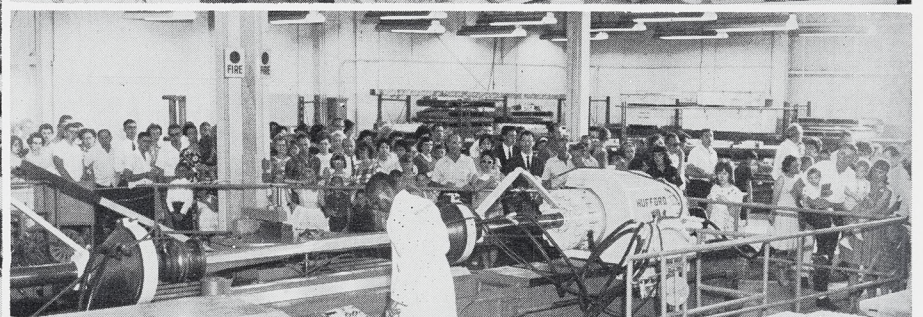
MR. JONES AND MR. NOLAN—Tour route is reviewed just before opening ceremonies during which they personally welcomed the visitors to the plant. John B. Clark, Norair director, Industrial Relations also addressed the waiting crowd. Said Mr. Nolan, "Family Day, 1963, will be one of the top successes for the year."



AND THE NEWEST—Two newest Norair employees, Helen Kin, Cost Estimating, at left, and Millie Frey, Graphic Services, listen while Bob Catlin, manager, Quality Control, a 24-year man and fourth oldest Northrop man in service years, compares this day with first family day, way back when. He stated, "It took only a few minutes to complete the tour then. Now three hours."



UP AND OVER—Advanced Production line and the F-5 airplanes proved fascinating place for old and young. Here, coming generation gets preview of what the pilot will see when he operates this Military Assistance Program fighter on her free world global missions.





RIDES WANTED

7 a.m. — 3:45 p.m.

GREEN & 190TH, Redondo Beach. Darlene Richardson, ext. 2520, FR 9-5164.

GAFFY & CAPITOL, San Pedro. John B. Crow, ext. 2020, 831-6560.

7:30 a.m. — 4:15 p.m.

LA BREA DRIVE & LARCH, Inglewood. Dorothy Minnich, ext. 1915, 674-1059.

ROSECRANS BLVD. & HIGHLAND AVE., Manhattan Beach. Mitch Morlan, ext. 1581, 379-3126.

8 a.m. — 4:45 p.m.

SAN VICENTE & SYCAMORE, Los Angeles. Sheila Fortine, ext. 1835, 933-1793, 933-6665.

RIDES OFFERED

7 a.m. — 3:45 p.m.

MOORPARK ROAD & GAINSBOROUGH, Thousand Oaks. From Thousand Oaks area or will make stops on way in via Ventura Freeway to San Diego Freeway. R. C. Evrist, ext. 2301, 495-4208.

BBSF Classified Ads

BBSF classified ad service is provided free of charge to all Northrop Norair personnel.

Ads for agencies, commercial enterprises and private businesses are not accepted.

Deadline is noon Wednesday, one week before publication.

FOR SALE

STEREO. Silvertone, 3 pcs. fruitwood finish, excellent tone & condition, \$150. OR 4-2433 after 5 p.m.

DAVENPORTS, 2, 8' Provencal, white print, \$195; Valentine Seaver, saae green, wool frieze, \$95; refrigerator, 183-lb. freezer comb., Kelvinator Foodarama, 16.8 cu. ft., \$200; chair, overstuffed, shell design, aqua wool frieze, \$15. FR 8-1106.

MOTORCYCLE, 1956, Ariel, 550 cc, single, \$199. ST 8-9709.

BICYCLES, 2, 26" Schwinn Tiger, boy's & girl's, \$25 ea. OS 5-6016.

SHEET FILM, Royal Pan, 2 1/4 x 3 1/4 rated at 400 ASA, dated December 1963 & February 1964. 25 sheets per box, 15 boxes, any quantity, \$3.75 box. FR 8-5710, after 6 p.m. & weekends.

PONY, 4-yr-old gelding, Shetland, silver-gray w/sulky, \$300. DA 7-0304.

AUSTIN HEALEY, Sprite, 1959, \$875. 325-3452.

CHEVROLET, Impala, 1960, 350 hp, S & W tach, 4:11 pos. traction, good tires, r/h, \$2000. OR 1-2847.

HOUSE, 4-bdrm., 1 1/4 baths, built-ins, intercom, partially carpeted, drapes, 2 patios, attractively landscaped, several trees, 3-yr-old, 10% down, \$28,950; air conditioner, Westinghouse, 3/4 ton, room-size, thermo. control, heating element, 110 volt, \$85. 324-2992.

DEEP FREEZE, 15 cu. ft., \$200. FR 8-1749.

PAINT SPRAYER, diaphragm-type, Craftsman, 35 lbs. pressure, on dolly, int. & ext. pressure-type gun w/30' hose, \$45; condenser checker, Heathkit, \$10; sander, orbital-type, small, \$5. SP 2-1992.

BABY BED, w/mattress, \$15; sofa, green, convert., ample storage in bottom, \$15. TE 3-4226 after 5:30 p.m.

GOLF SET, Wilson, matched, Gene Sarazen signature, 4 woods, 9 irons, putter, bag, \$75. 375-4593.

BICYCLES, mailman basket, \$8; 10 speed English, \$60; outboard eng., Elain, \$38. Box 1401.

FALCON, 1960, 4-dr. deluxe, fully equipped, orig. owner, \$900; stove, Wedgwood, \$50; couch, convert., \$15; wheelchair, \$35; refrigerator, Admiral, apt. size, \$25. EX 2-2628 after 5 p.m.

TV, 16". \$15; clothesline posts, pr., \$5; bicycle, 20", \$2; 26", \$3; miscellaneous toys & games, 10¢ to 50¢; books, paper back, 5¢ ea.; irons & perc., elec., \$2 & \$3; divan & 2 matching chairs, \$100. 379-1049 Saturdays or Sundays.

BUICK, 1952, stick shift, good tires, \$100. Box 1402.

KARMAN GHIA, 1958 coupe, Blaupunkt 3-band radio, w/w Dunlop tires, new spare, 36,000 miles, \$1175. 933-1793, 933-6665.

SHOTGUN, Browning, 20 ga., 3" mag., over & under, super jet loader, 20 ga., Lochmiller, \$250. FA 8-5365.

RANGE, gas, 42" Tappan, \$20; medicine cabinet, \$1; lite fixture, kitchen-type, \$1; chrome table & 4 chairs, \$15. FR 5-2866.



THE RUSH IS ON—Exciting scene typical of the movie "How the West Was Won," to be shown at an exclusive Northrop Theatre Party, August 17, at Warner Cinerama Theatre. Prices reduced for all personnel. The picture in-

cludes such stars as Gregory Peck, John Wayne, James Stewart, Debbie Reynolds and many others. Fast tempo poster shows buffalo stampede, train wreck, plus fast guns. For ticket costs, see story, page one.

FOR SALE

PONTIAC, 1954, 2-dr. sedan, 8-cyl. HM, \$295. FR 9-5690.

DKW STATION WAGON, 1961 assume \$68.23 mo. payments, \$753. 676-9558.

BICYCLE, boy's 26", \$15; bed & mattress, \$25; stove antique, gas, \$10; lamp, Desert air, \$30; davenport, \$10; den set, \$30; wheelbarrow, \$5; stroller, \$2; baby auto buaqy, \$5; TV, 17", \$25. 433-1406.

TRANSMITTER, T-21/ARC-5, Navy surplus, \$5; dynamic speakers, 2, 12", \$1 ea.; other PM speakers, 50¢-3; inverter, laboratory dc vibrator, \$4; time meters, 2, industrial-type, \$2 ea.; radio chassis, 15 AM, \$1-\$2; audio parts, assorted TV, radio, 25¢-\$1. FA 8-0460.

TANDEM BICYCLE, Huff, \$70. GE 9-4500.

CHAIRS, green, \$15; rose damask, \$25; tan, \$10; fireside rose damask, 2, \$50; coffee table, \$10; ironer, Thor, \$5; 3 mirrors, \$17; lamps, 2, tall, \$15; lawn mower & edger, power, \$40; end tables, 2, walnut, \$15. PL 8-7214 evenings.

LAWNMOWER, power, reel-type, 2 hp, 4-cyl. Briggs & Stratton eng., \$20; mixer, Sunbeam; auto. toaster, Camfield, both for \$10; flatware, Americana Star stainless steel, 66 pcs., service for 12, w/chest, \$25; chair, upholstered, \$8. OS 6-3631.

HOUSE, 4-bdrm., 2 baths, family room, sunken living room, 15'x33' pool, Southwood Estates, \$30,950. FR 1-3247.

SIMCA, 1959, h/top, r/h, seat belts, vinyl interior, \$450. DA 9-1705.

CORVETTE, 1959, h/top, auto. trans., w/s/w, 42,000 miles, \$2100. Box 1403.

CADILLAC, Coupe De Ville, 1961, factory air cond., cruise control, full power, 19,000 miles, \$3995. 377-4207.

WATER SKIS, Hedlund Hydroflite, new, \$24. OR 0-4490 evenings.

LATHE, wood, Sears, \$15. OR 7-5658 after 7 p.m.

PUPS, miniature Dachshund, AKC, \$50 ea. OS 5-8414.

RANGE, O'Keefe & Merritt, gas, automatic, \$35; bed & springs, single, \$8. 423-1978.

HOUSE, 3-bdrm., 2 baths, contemporary, parquet floors, yard immediate occupancy, \$28,250. DU 8-4252.

MERCURY, 1951, good transportation, \$100. 329-9484.

WASHER & DRYER, Westinghouse, 10-yr-old, \$75 for set. FR 5-0743.

BOAT, 15.5', Sport Fisherman, home made, w/cabin, Johnson 30-hp motor, portable bait tank, trailer, \$450. 371-9730.

WHEELS, set of 4, 15", chrome, \$50. 672-8290.

RANGE, gas, \$35; tent, 9'x9' umbrella-type, \$12. 379-6284.

HOUSE, 3-bdrm., 1 1/4 baths, custom designed, elec. kitchen, 2 patios, blocked yard, near Del Amo shopping center, \$23,500 or best offer. 371-4797.

PUPS, 6-wks-old, Beagles, AKC, \$35 ea. FR 5-5171 after 5 p.m.

VOLKSWAGEN, 1961, deluxe, vinyl interior, transistorized radio, w/w tires, 33,000 miles, will take transportation car for my equity, \$1495. 376-3603.

SKI BOAT, 16', Ford V-8 inboard, alashed hull, w/trailer & accessories, \$575. FA 8-4188.

OVERDRIVE, tiptomatic, for Chevrolet, \$20; lumber, plating-type, 500 ft. 1"x6". \$10. OS 5-2159.

MOVIE CAMERA & equipment, Mansfield-Holiday, 8mm, 3-turret, regular, wide & telephoto lens, built-in exposure meter, standard roll loading, leather case, metal film box, 3-bulb lite bar, viewer, splicer, projector, 300 cp zoom lens; screen, silver beaded, 4'x5', \$100. 753-5704.

FOR SALE

CORVAIR, 1960, 500, 2-dr., iade green, heater, \$795. DA 6-2695.

UNICYCLE, heavy duty, \$25. OS 5-0279.

CAR COOLER, Bon Aire, 12 volt, deluxe model, cost \$65, \$25. FR 5-8551.

SPRITE, 1960, w/w, r/h, red int., \$800. OS 6-8253 days, OS 6-9970 evenings.

CHEVROLET, 1956, Del Rey, Powerglide, r/h, new w/s/w tires brakes, tune-up, \$650. GL 4-4270.

BUICK, Riviera Roadmaster, 1955, orig. owner, full power, new brakes & brake drums, \$395. FA 1-0020.

T-BIRD, 1960, white, sliding sun roof, full power, w/new brakes & w/w tires, misc. new items, assume credit union loan of approx. \$1300 & approx. \$800 for equity, \$2100. DA 6-5558.

HOME, 3-bdrm., family room, 2 baths, built-ins, carpets & drapes, fully landscaped, metal sprinkler system, \$27,900. 372-2826.

WANTED TO BUY

CEMENT MIXER. 378-5348.

FREE (to be given away)

WASHER & DRYER, comb., O'Keefe & Merritt. OS 5-1347.

RENTALS OFFERED

APTS., 1 & 2-bdrm., carpets, drapes, all elec., built-ins, Lawndale, unfurn., from \$120 mo.; furn. from \$137.50 mo. 326-0474.

DUPEX, 1-story, on bus line, children & pets OK, range & refrigerator avail., lae. fenced yard, \$70 mo. OS 5-1123.

HOUSE, 2-bdrm., unfurn., aarage, patio, corner fireplace, h/wood floors, 1 child OK, near schools & shopping area, \$100 mo. OS 6-0695.

MOUNTAIN CABIN, 1/2 mile from lake & village at Arrowhead, sleeps 6, modern utilities, patio, \$45 wk. 379-2504.

APT., 2-bdrm., modern, w/w carpet, drapes, built-ins, disposal, aarage, 1 mile from Northrop, \$100. OS 6-2501.

APT., unfurn., 2 lae. bdrms., stove & refrigerator avail., aarage disposal, aarage, near Northrop, shopping, children OK, \$90 mo. DA 9-0314.

APT., 1-bdrm., unfurn., w/w carpeting & drapes, built-in refrigerator & stove, close to Northrop, utilities paid, \$110 mo. OS 6-4157.

DUPEX, 2-bdrm., lae. yard, close to Norair, avail. Aug. 15. \$100 mo. ME 0-1696.

APT., 1-bdrm., furn. or unfurn., near Northrop, shopping, transportation, water & trash paid, carports, disposals, drapes, \$80; house, 2-bdrm., tile kitchen & bath, gas log fireplace, \$90. OS 5-9695.

HOUSE, Lake Arrowhead, 2-bdrm. & lae. dorm, 2 baths, sleeps 11 to 15, sun deck, patio, private beach, parking, across from lodge on main road, completely furn., \$200 wk.; quest house, same advantages, sleeps 2, \$45 wk. EX 9-1345 evenings.

HOUSE, 3-bdrm., unfurnished, carpets, drapes, fenced yard, redecorated, \$135 mo. FR 9-9786.

RENTALS WANTED

HOUSE, 3-bdrm., built-ins, fenced yard, 2 children, will pay \$135 or \$140. OX 3-5257.

CHILD CARE WANTED

HOUSEKEEPER, mature, care for 2 children, ages 4 & 6, 7:30 a.m. to 5:30 p.m., 5 days, must have own transportation to Rolling Hills. 326-2728.

Today—Last Day To Enter Table Tennis Tournament

Today is the last day to enter the NRC Invitational Table Tennis Tournament between Norair, ES&E and NSS. It is scheduled to be held Sunday, August 4, from 1:30 to 5 p.m.

Play will consist of double elimination singles and round robin doubles. Events will be men's and women's singles and doubles, plus special class B singles for NSS only. First and second place winners of each event will receive trophies.

The tournament will be held in the Brookhurst Junior High

POLICE VETERAN GUEST SPEAKER AT M-C MEETING

Northrop Management Club President Ed Laski has announced that guest speaker at the Friday night, August 2, dinner meeting will be Sergeant Fred Kalas, 10-year veteran with the Los Angeles Sheriff's Office. His topic will be "The Narcotics Problem in the Los Angeles Area."

Comic Billy Gilbert will supply the evening's entertainment.

Location of the meeting is the Airport Marina, Lincoln & Manchester Boulevards. Social hour is at 5 p.m. Dinner is served at 6.

SAN CLEMENTE GOLF TOURNEY WINNERS TOLD

Winners of the NRC Golf Club tournament held at San Clemente, July 21, are J. D. Gordon, overall low gross 78, and Jake Jacobson with overall low net 67.

Flight winners are: Tom Williams in first flight with 68; three-way tie between M. F. Coffman, Tom Stinson and Bob Tompkins with second flight 72's; Jim Morris and Art Richards both fired a 69 for third flight tie; and Jim Bearn and Tom Horn came in with 69's for fourth flight tie.

PERSONALS

THANK YOU for your kindness & sympathy at a time it was deeply appreciated. MRS. RUDY HORWAT, CANDY, JAN & JOHN.

WANT 2 female riders, to South Dakota, share expenses, leaving Aug. 15. 327-1178.

ENGINEER to share large 2-bdrm. furn. new apt., 15 minutes from Norair, all elec. w/pool, reasonable. 370-3458.

RIDERS WANTED, 1 or 2, to New York City, leave Sept. 10, arrive Sept. 14, share driving & expenses. Box 1404. L

School gymnasium, reached from the Brookhurst Boulevard off-ramp, Santa Ana Freeway, in Anaheim.

Personnel Activities office will accept entries. For information, call Don Greco, extension 2784.

BOWLING CLUB WINTER LEAGUES NOW FORMING

Bowling Club Commissioners Bill Myerson and Corinne Davis announce that winter bowling leagues are now forming, and will begin rolling the first two weeks in September.

Those wishing to enroll in the bowling program may pick up an entry form in Personnel Activities.

Family Day

(Continued from Page 1)

People who got lost—several children, at least one wife—didn't stay lost for over 15 minutes.

Five thousand doughnuts were eaten.

Three thousand cups of coffee went down the hatch.

Forty-eight hundred ice cream bars went the way of all good ice cream bars.

Six hundred fifty packs of potato chips were munched. Gallons and gallons of punch.

Refreshments were all free.

There is no record of the ohs and ahs, wait a minutes, hurry ups, what is that, how does this works. Probably several million.

Medallions? Over 22,000.

Family Day was a big, big, big day.

Displays and products from Norair's corporate sister organizations proved to be big hits with the crowd. Ventura, Northrop Architectural Systems, Nortronics, Northrop Space Laboratories were represented by excellent efforts, which attracted thousands along the line of tour. Electronic gear, the astronauts' ringsail parachute, deep space projects, all scored high in interest and popularity.

For comments on what people thought about Northrop Norair Family Day, the News conducted capsule-type interviews.

See page three.

NORTHROP NORAIR NEWS

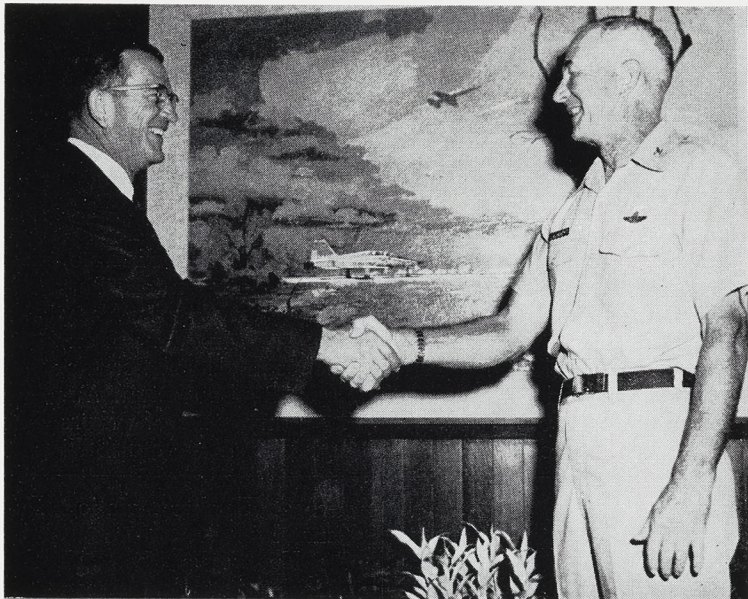
Issued biweekly by Norair Division of Northrop Corporation

• Wednesday, August 14, 1963

HAWTHORNE, EDWARDS AFB, PALMDALE

SAN ANTONIO, EL PASO

On the T-38 Scene



A PAINTING FOR RANDOLPH—Corporate Vice-president and Norair General Manager Dick Nolan, presents large T-38 oil painting to Randolph AFB Officers Club. Accepting in behalf of Club's board of directors is Colonel Jack W. Saunders, base commanding officer and commander, 3510th Flying Training Wing. Painting was done by Norair artist, Harland Krug. While at the base Mr. Nolan and Northrop party led by Robert R. Miller, senior vice-president, participated in retirement ceremonies held for General James E. Briggs, commander, Air Training Command. Other participants were John R. Alison, Corporate vice-president, Customer Relations; S. W. Towle, jr., vice-president and manager, Eastern Regional office; and Dan Collins, Northrop representative, San Antonio.

General Briggs Retires, Flies 100,000th T-38 Hour

Lt. General James E. Briggs, jr., retiring commander of the Air Training Command, made his final flight as an active U.S. Air Force officer a memorable one July 30 at Randolph AFB, Texas.

General Briggs was at the controls when the 100,000th flying hour was logged for USAF's Northrop T-38 Talon supersonic jet trainers.

He retired the next day, completing 35 years of military service. He is succeeded in the top ATC post by Lt. General Robert

W. Burns.

With General Briggs in the Northrop T-38 during the 100,000th flying hour was Lt. Colonel Arthur W. Buck who piloted the first T-38 delivered to ATC at Randolph AFB, on March 17, 1961. Colonel Buck was with General Briggs on his first T-38 flight at Palmdale, California, two years ago.

Preflight briefing for his last flight was given General Briggs by Colonel James H. Watkins, commander, 3510th Flying Training Group, Randolph AFB.



SALUTE—Lt. General Robert W. Burns (right) takes over as commander, Air Training Command, at change of command ceremony July 31 at Randolph AFB, Texas, succeeding Lt. General James E. Briggs who retired after 35 years in the military.

F-5 MAP FIGHTER MAKES FIRST TEST HOP AT EDWARDS AFB

The F-5A Military Assistance Program fighter-bomber made its first flight from Edwards Air Force Base, July 31, exactly on schedule.

At the controls was Henry "Hank" Chouteau, F-5A Project pilot.

Stated Corporate Vice-president and Norair General Manager Dick Nolan in an announcement to all personnel, "Northrop Norair can be proud of this achievement. It represents teamwork, know-how, and initiative of a high order, as well as outstanding support from the U.S. Air Force. I take great pleasure in commending you who made it possible . . . You have made a significant contribution to the defense of the free world."

The first flight marked a scheduled milestone in the F-5 project for which the Department of Defense announced the Northrop contract last October. The Edwards flight came less than 10 months later.

A second F-5A will be completed this month, and a third will fly in October as the Northrop Norair production line begins to roll.

The 1000-mph F-5A incorporates several improvements over the original version of this fighter family developed under the Northrop designation N-156. These improvements will be demonstrated in the test program which began with the first flight.

Gen. Burns Made ATC Commander

HQ. ATC, RANDOLPH AFB, TEX.—Lt. General Robert W. Burns assumed command July 31, 1963 of Air Training Command, succeeding Lt. General James E. Briggs.

Change of Command ceremony, featuring a retirement parade and review and attended by ATC training unit commanders from bases across the nation, was conducted at 9:30 a.m., July 31, on the east ramp, Randolph AFB.

During the ceremony, General Briggs was presented the First Oak Leaf Cluster to the Distinguished Service Medal for his "exceptionally meritorious service to the United States in a position of great responsibility as commander, Air Training Command, from August 1, 1959 to July 31, 1963."

Presentation was by Major General H. K. Mooney, ATC vice-commander.

A reception followed the ceremony at the Officers Open Mess for all commanders and guests.

They include more powerful General Electric J-85-13 engines and seven external locations for armament and additional fuel instead



HANK CHOUTEAU

of the five stations of the N-156.

With seven external stations, the F-5A carries a combat load of 6200 pounds. The stations include one centerline pylon, four pylons under the wings and provisions for fuel tanks or Side-winder missiles on each wingtip. The armament load includes guns, bombs, missiles and napalm.

The F-5B two-seat fighter-trainer version, also programmed for MAP nations, is scheduled for first flight next March.

The F-5A and F-5B will replace older frontline aircraft. They will be capable of intercepting enemy aircraft, destroying supply and communication lines, providing close support for ground troops, and performing

(Continued on Page 3)

Norair Participating in AADS-70s Study for Army

Three contractor-subcontractor teams have been awarded half-million dollar contracts each to study the technical feasibility of a new field Army air defense system.

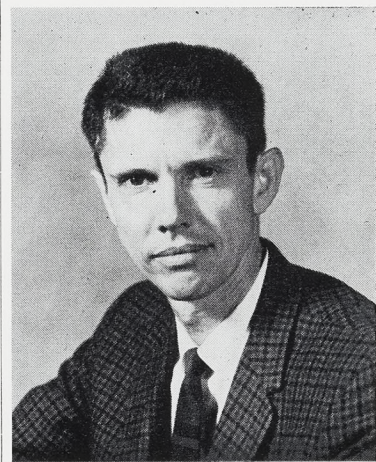
The system, still in the early planning stage, is AADS-70s—Army Air Defense System for the 1970s.

Ed Taylor, Advanced Missile Systems, Technical, will be project engineer.

In commenting on the AADS-70s study contract, Mr. Nolan stated, "This important work for the United States Army, being done under subcontract to our team leader, the Raytheon Company, presents a fine opportunity



WALT FELLERS



ED TAYLOR

The three teams as announced will be headed by Raytheon Company, by Hughes Aircraft Company, and by Radio Corporation of America.

Norair is participating as a subcontractor to the Raytheon Company. International Business Machines is also a member of this group.

Department of the Army said AADS-70s will be designed to supplement or selectively replace some of the existing air defense systems with emphasis on countering anticipated tactical missile threats during the 1970s.

Corporate Vice-president and Division General Manager Dick Nolan has placed Walt Fellers, director, Long Range Planning, on special assignment to direct the overall Norair AADS-70s program.

to apply our missile capability. Our contribution to the program will have the support of the best talents at Norair."

The U.S. Army Air Defense Digest, published by the Army Air Defense School at Fort Bliss, Texas, says the requirement for an improved surface-to-air missile system became apparent during an evaluation of field Army air defense conducted by Combat Developments Command in the fall of 1962.

AADS-70s is to be mobile and capable of engaging several targets simultaneously, with a high system reliability factor, says the Digest.

The Raytheon-Northrop Norair-IBM team will perform their work at Bedford, Massachusetts, Hawthorne, and Rockville, Maryland.

(Continued on Page 2)



A Portrait— In Orderliness

I was the recipient of a rare treat a short time ago when Byron Bonnett and Leo Richman made it possible for me to visit the Records Center located hard by the Plant on Weber Way in Hawthorne.

Both Mr. Bonnett and Leo proudly boast that Records Retention Analyst Van Bogardus is, in truth, an unsung hero, a man who quietly but most efficiently pursues his job responsibilities in a manner that has brought nothing but plaudits from our customer and visitors from other plants who find their

has not asked a requester to wait more than 24 hours for the record sought. In fact, most are provided within a few hours. Picture, if you can, aisle after aisle from the floor to the ceiling of cardboard file cabinets stacked in apple pie order, well indexed for ready reference, such files as those of the Medical department, cancelled pay checks from Accounting, personnel records of all types, and ADAC compartments for certain classified documents.

Speedy accuracy is a watchword of Van Bogardus' opera-

By John B. Clark

Norair Director, Industrial Relations

way to the Center. Van is a gentleman you would not meet too frequently in walking through the Northrop Norair corridors, as he is domiciled somewhat apart from our main plant and the nature of his business does not permit frequent contact with him. But, nonetheless, the grand job he is doing in riding herd over the Records Center should not be overlooked by any one of us.

There is an old saying, "A place for everything and everything in its place." Van must have been an early disciple of the philosopher who made that statement for his efficient filing system of plant records of all descriptions is really a sight to behold.

Van has been a Northrop man for over 10 years and has learned the value of friendly associations. Here is a man who really goes out of his way to provide promptly any record requested and it has been said to his everlasting credit that to date he

tion. On my tour I held in my hand the file copy of the oldest X-ray taken by our Medical department way back in 1943.

The Center at the present time houses more than 30,000 file boxes of all sizes. Van boasts of 20,000 cubic feet of records which, if stored in traditional file cabinets, would require 3500 cabinets. He estimates that within the files there are at least 40,000,000 pieces of paper and the dexterity which he employs in quickly recovering a file item is nothing short of amazing.

Yes, here is a fellow employee



VAN BOGARDUS—

who may be away from our midst but is not forgotten and is entitled to the recognition this article is giving him. The Good Book tells us, "Show me a man diligent in his business; he will stand before kings." So, when we see Van the next time, we shall ask him, "How are things going down at the palace?"

NINETEEN 20-YEAR PINS PRESENTED—Nineteen more Norair folk met with Dick Nolan, Corporate vice-president and Division general manager, seated at head of table, to receive diamond-studded pins for two decades of service. From left, seated, Bert Vallumstad, James Reed, Beulah Gattian, Pearl Everley, Mr. Nolan, Mary Harris, Mary Dougherty, and Ada McMillen. From left, standing, Julius Statley, Max Andersen, Lavern Parker, Douglas Hugill, Everett McClellan, Charles Hutcheson, Lloyd Perkins, Harry Lantz, Charles Oates, Jerry Sutherland, David Carson, and Reuben Oian. Mr. Nolan took the opportunity for an impromptu briefing on Company state-of-affairs and to talk about highlights in the past. Persons wearing 20-year pins now total 836.

AADS—70s Study

(Continued from Page 1)

land respectively.

Mr. Fellers, a 9-year man, is well known at the Division for his engineering work on our major subcontracting program with Raytheon on the Hawk program.

M-C PAYS VISIT TO VENTURA

Norair Management Club members, 96 in number plus 26 guests, led by President and Mrs. Ed Laski, paid a friendship visit last weekend to the Northrop Ventura M-C organization.

Welcome was extended by Ventura President W. C. Briggs.

A prime rib dinner was served in the division's plant cafeteria, host Bob Wilson.

A tour of the facility and colored motion pictures of Northrop Ventura products highlighted the program.

P-A COUNTER SERVICE NOW OPEN LONGER

Personnel Activities counter service hours, now in effect, are from 8 a.m. to 4:45 p.m.; it has been announced by Dick Pryor, general supervisor.

Old hours were 11 a.m. to 12:50 p.m. and 3 p.m. to 4:50 p.m.

Services include:
Mutual Theatre ticket agency.
Activity reservations.
Money orders, traveler's checks and utility bills.
Traffic fine payments.
Sales of golf and tennis balls, vitamins.

TEAM CALL FOR SEVEN-MAN FLAG FOOTBALL

Teams for Norair's Flag Football league, in its second year of NRC sponsorship, should now be forming, according to Commissioner Earl Sanders.

Teams will consist of seven men, with a maximum 15-man roster.

Practice play begins Saturday, September 7; league play, September 21, at Alondra Park.

For information, call Personnel Activities, extension 2784.

The Hawk, for which Northrop conducted research and development and manufacture of air-frame components and weapons system support equipment, has been termed one of the most versatile weapons systems of its type available today.

The Hawk is well into its second year of service with 13 Army battalions deployed in West Germany, the Panama Canal Zone and the island of Okinawa in the Pacific.

U.S. Marine Corps fielded its first Hawk systems more than a year ago, using a "stripped-down" battery concept that makes all components air transportable by helicopter.

Mr. Fellers, AADS-70s director, graduated from the College of the Pacific, Stockton, California, AB engineering, in 1940. He did graduate work at the California Institute of Technology through 1942 where he received his M.S. degree in aeronautics.

Prior to coming to Northrop, he was assistant chief of Aerodynamics at North American Aviation, 1942-53, and staff en-

gineer at Fletcher Aviation, Pasadena, 1953-54.

At Norair he has held the positions of staff engineer and technical assistant to the vice-president, Engineering. He has been director of Long Range Planning for two years.

Mr. Taylor, a 12-year man, was educated at the California Institute of Technology where he achieved his bachelor of science degree in 1945, mechanical engineering. He did graduate work at University of California being awarded his master

The Big Picnic

WATCH FOR DETAILS

of science in mechanical engineering in 1951.

He came to Northrop directly from school where he has successively held positions of stress engineer, F-89 and SM-62 Stress and Weights; senior engineer, Structures Research; and engineering specialist, Advanced Missile Systems.

Urban League Display



NORTHROP EXHIBIT—William Justice (left), senior information processing analyst at Northrop Norair, welcomes William Larrabee, Northrop Corporate vice-president, legal, to Northrop's exhibit at the national meeting of the Urban League held recently in Los Angeles. Mr. Justice was in charge of the exhibit at this event.

C-O-L HOURLY RAISE NOTED

Division hourly paychecks were increased one cent an hour effective August 5 as a result of a June rise in the Bureau of Labor Statistics Cost of Living Index. Reading was up one half cent to 130.8.

The next reading will be taken in September. If further change results at that time, effective date will be November 4.

RESEARCH LAB — LATEST STEP IN FACILITIES GROWTH PLAN

Completion of the initial building phase of Norair's new Research Laboratory, 12,800 ground floor square feet of research area and 9600 square feet of second floor office space, marks another important step in the Company's long range building plan.

It becomes the latest addition to the Corporation's facility modernization and expansion program which now represents added capital investment of over \$50 million, accumulated during the 5-year period 1957-1962.

It joins other distinguished new-look structures on the Division's skyline including the hypersonic wind tunnel, the new assembly building, and the earlier built Engineering and Science Center and plant cafeteria.

The Research Building is the first phase of a long range plan for a centralized engineering laboratory complex.

The assigned purpose of the Research Laboratory is to provide support to help develop new business capabilities for Norair

ants are the Research Laboratories and the Engineering Laboratories groups. Chiefs are Paul Jensen and Royal Jackman.

Of primary program emphasis was the completion of the Flight Dynamics Research lab for Mr. Jensen's group, consisting of flight simulation and accompanying computer support rooms. This was accomplished, and a six degree-of-freedom simulator is now undergoing shakedown tests.

In this laboratory the aerodynamic flight response characteristics of aircraft are simulated by analog computers programmed

MR. JONES ON FACILITIES

Corporation President and Chairman Thomas V. Jones in an address to the New York Society of Security Analysts: "... New facilities increase our capability to win new business, they give our people better tools to work with, a better environment to work in, and at the same time bring cost reductions through greater efficiencies ..."

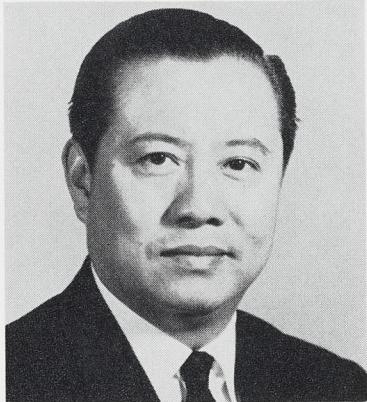
"... Improvement of our facilities made possible the hundred million dollar growth in our volume that took place over the past five years. Far more important, it represents an investment in future growth. These, along with our constantly expanding technical skills, are the resources with which we expect to win an expanding share of defense and space business ..."

Technical's Research and Development and Technical Operations departments. Kermit Van Every and J. D. Matthews, managers, respectively. Present ten-

Dr. Wong to Head Session At Tokyo Meet

Norair's new chief of Structures and Auxiliary Systems group, Dr. C. M. Wong, has been invited to serve as chairman of the Electronics and Power session at the Fifth International Symposium on Space Technology and Science, Tokyo, to be held next month, September 1 to 7.

With areas to be discussed highly diversified and significant



to aerospace technology and sciences, participation will be on a worldwide basis with contributions from scientists from the western world and from the Red bloc countries and their satellites as well.

Dr. Wong, who for the past few months has been engaged in solicitation and review of technical matter for Tokyo, has received papers from General Dynamics, General Electric, Radio Corporation of America, Aerospace Corporation, and Thompson Ramo Wooldridge. His

to drive the simulator. The pilot's natural response to given flight conditions control the cockpit actions.

Also on the ground floor are other research laboratories:

Communications and Radar Laboratory—Enables experimental investigation of advanced concepts in surveillance, communications, tracking, countermeasures and general areas of information transmission as applied to aircraft and missile systems.

Structural Dynamics Research Laboratory—Utilized for development of theories and verification of analysis connected with structure behavior during fluctuating load conditions.

Thermo-Structures Research Laboratory—Provided for study of structures when subjected to extreme temperatures under test conditions.

Flight Control Research Laboratory—Engaged in studies of concepts in guiding and controlling advanced flight vehicles, including manned aircraft which require automatic guidance to assist the pilot, and unmanned missile guidance.

Research Lab future proposals call out additional laboratory floorspace for Optical and Electro-Optical, Propulsion, Human Engineering, Basic Physics and Basic Chemistry plus a clean-room area.

Engineering Laboratories proposals include development labs for flight controls, hydraulics, fatigue and structural tests and drop tests.

Additional office space is also planned.

symposium presentation will be entitled "Next Decade in Solid Propellant Technology."

Dr. Wong came to Norair in March of this year. He has had over 21 years experience in the fields of astronautics systems, propulsion, space sciences, and materials and advanced aerospace planning.

Travel Club Plans Yearend Hawaii Trip

A holiday trip to Hawaii! Twelve days at the yearend. Open to all Northrop personnel.

Dates are December 21 through January 1.

Cost of the trip, including travel, food, lodging and tours will be \$338 for adults, \$228 for children under 12. These prices are based on an anticipated air travel cost reduction from the present package rate of \$398.

Itinerary, states Travel Commissioner Howard Cornelius, will include trips to the islands of Hawaii, Maui and Oahu, also an optional trip to Kauai.

First Flight

(Continued from Page 1) surveillance and reconnaissance missions.

The F-5 is the only U.S. supersonic aircraft capable of landing on a sod field. Being independent of thick concrete runways and vast base installations, it can operate close to the combat area.

Northrop Corporation recently received Department of Defense definitive contracts totaling \$80,747,500 for F-5A and F-5B production.

NORTHROP NORAIR NEWS

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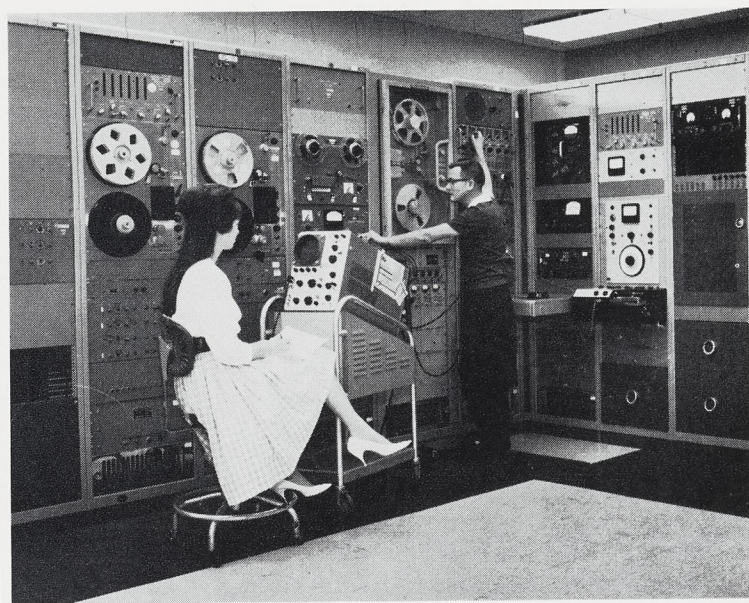
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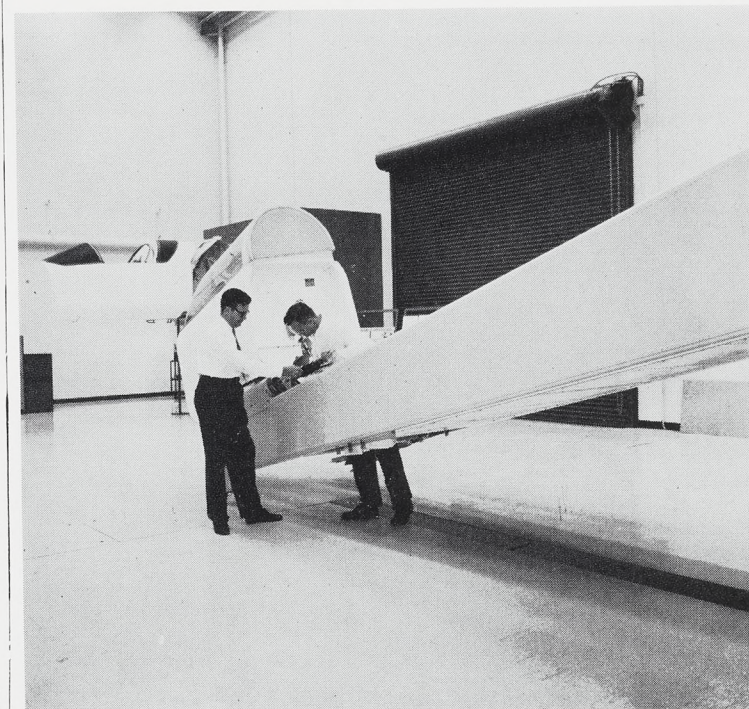
CHARLES BRADFORD, Editor

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Added Capability



NEW LABORATORIES—Warren Tribble, research assistant, Structures and Auxiliary Systems group, feeds tape recording of LFC jet engine sounds through wave analysis equipment in Structural Dynamics Research Laboratory. Joanne Martin, data technician, Research Laboratories group, takes reading on an oscilloscope. Information fed to the sound wave analysis equipment will later be used for precision data reduction and spectrum analysis.



TRUE FLIGHT SIMULATION—With new six degree-of-freedom flight simulator, actual flight conditions are reproduced. The simulator pilot responds to hypothetical in-flight situations given him by analog computer. His reactions control the motion of the cockpit. Herb Cooles, left, senior engineer, Research Laboratories, and Robert Crawford, research assistant, Engineering Laboratories, make pre-flight check on cockpit hydraulic system. Two-axis simulator is in background.



NEWEST ADDITION TO NORAIR'S SKYLINE — The Research Laboratories represents another important step in the Company's long range facilities modernization and expansion program. Purpose of the lab is to provide support to advanced design and research activities of Norair's Research and Development department, and to house the new six degree-of-freedom flight simulator. Entering are Pat Davis, left, stenographer; Coleen Nelson, office clerk; and Stan Racisz, engineering specialist, Research Laboratories group.



RIDES WANTED

8 a.m. — 4:45 p.m.

HARBOR BLVD. & ADAMS, Costa Mesa. From Costa Mesa, Newport Beach area. J. E. Meyer, ext. 2079, KI 9-3121. 5

NEWPORT-COSTA MESA VIA PACIFIC COAST HWY., Newport Beach. Saxe Dobrin, ext. 1506, LI 8-2145. 5

RIDES OFFERED

7 a.m. — 3:45 p.m.

VICTORIA & AVALON, Gardena. Genaro Chapa, ext. 2568, DA 3-9447. 12

8 a.m. — 4:45 p.m.

NEWPORT-COSTA MESA VIA PACIFIC COAST HWY., Newport Beach. Saxe Dobrin, ext. 1506, LI 8-2145. 15

HARBOR BLVD. & ADAMS, Costa Mesa. From Costa Mesa, Newport Beach area. J. E. Meyer, ext. 2079, KI 9-3121. 15

BBSF Classified Ads

BBSF classified ad service is provided free of charge to all Northrop Norair personnel.

Ads for agencies, commercial enterprises and private businesses are not accepted.

Deadline is noon Wednesday, one week before publication.

FOR SALE

BAR, formica top, 2 wrought-iron stools w/Navaghyde cushions, \$25. DA 4-5774. A

TRAILER, 1959 model Midway, 20', custom-built, self-contained, at Desert Hot Springs Trailer Park, space paid through Nov., \$1475. 377-6622 eveninas. A

OLDSMOBILE 88, 1955, 4-dr., \$325. HA 1-4869. A

RANGE, 4-burner, white, \$5. OS 5-1123. A

HOUSE, 3-bdrm. & den, 1 1/2 baths, built-ins, fence & patio, near schools, \$18,500. OX 3-5257. A

CARBURETOR, 4-bbl. from 1962 Oldsmobile Starfire, \$25. 370-3458. A

BICYCLES, boy's 26", reg.; 3-spd., \$18; ea.; motor bike, \$50 or offer. PL 5-4497. A

RANGE, Autolec, full-size, \$20. FR 7-4437. A

BOAT, 12' Merline runabout, mahogany top, \$200; cabin in Fallsview, w/large lot, 2-bdrm., near lake, pool, falls, \$6500. 679-8426. A

MG-TD, 1951, 4 new tires, motor recently o/hailed, inc. brakes, \$650. LU 2-6790 after 5 p.m. A

CHEVROLET, 1962, 409 cu. in. eng. w/409 hp, 4-spd. w/tachometer, \$2500 or make offer. DA 4-3600. A

MOTORCYCLE, 1955 Velo, 500 o/head cam, single, \$250; Chevrolet pickup, 1959, recently o/hailed, \$400; Renault, 1959, \$400. Box 1501. A

REFRIGERATOR, gas, Servel, apt-size, \$20. 677-1953. A

LOT, 117'x140', Victorville, utilities in, near schools, shopping, George AFB, \$2950. OL 6-6319, WE 3-8511. A

BUICK, Roadmaster, 1956, all power, \$375. Box 1502. A

MOTORCYCLE, Zuzuki, Honda-type, \$225 or best offer. FR 4-1725. A

DRYER, Whirlpool, gas, w/lint filter, \$50. DA 4-9079. A

STOVE, 4-burner, \$50. OS 6-0749. A

PLYMOUTH, V-8, 1955, 4-dr. stick, o/drive, \$225; Buick Special, 1952, stick, \$100. Box 1503. A

BICYCLE, girl's, 26", new paint, \$20; movie camera, 8-mm Dejur, 3 lenses, 5 spds., \$40. PL 4-6428. A

BICYCLE, girl's, hand brakes, new tires, \$30; surfboard, balsa wood, 9'3", \$25. AX 2-4958. A

GOLF CART, Wilson Classic, lightweight, auto. closing, folding, \$20. PL 5-8104. A

CAMPING EQUIPMENT, 9'x11' tent, \$15; stove, 2-burner, \$7; sleeping bag, \$2; 5 camp stools, 50¢ ea.; 4 cots, \$4 ea.; luggage rack, 3'x7'x5'x8" deep \$10. PL 5-9345. A

SKIS, Fisher, Christy poles, parka, boots, Kofac, boottree, ski & pole case, \$60. WE 3-6665. A

MOVIE EQUIPMENT, 8-mm camera, projector & screen, \$60. OS 6-1985. A

DODGE, 1957 Custom Sierra, 9-pass., station wagon, full power, r/h, \$650. DA 4-3062. A

RANGE, elec., \$35. PL 8-7251 after 4:30 p.m. A

FORD, Futura Falcon, 1963, convert., 4-spd., \$2341 at \$86 mo. payment or \$2097. OS 5-1682. A

REFRIGERATOR, Servel, gas, 8 cu. ft., cross-top freezer, \$50. FR 5-9985. A

PUPPIES, 6-wks-old, from med.-sized mixed breed, \$3. FR 1-8590. A

FOR SALE

ORDNANCE WEAPON, German WW II, used by parachute commandos, \$125. 477-5957. A

PONTIAC, 1955, Star Chief, h/top conv., r/h, p/steering & brakes, \$350 or best offer; sailboat, 20', sloop rigging, cabin, sleeps 2, outbd., many extras, terms, \$1975. TW 7-4851. A

TUNER, Eico FM, \$30; sewing machine, Kenmore, console, \$60; tricycles, 2, 18", \$3, \$4; redwood fence, 20 ft., 6' high w/aate, \$25. DA 9-7994. A

FURNITURE, couch & chair, \$35; corner table, blond, \$10; end tables, 2 walnut, \$10; dinette set, w/buffet, \$40; sewing machine, White, treadle-type, \$5. PL 4-6146. A

CABIN CRUISER, 21' glass hull over 1/2" plywood, Oldsmobile eng., Chrysler marine trans., \$2000. TR 1-8059. A

PLYMOUTH, station wagon, 1956, auto., r/h, w/w, \$485. 421-2113. A

SKI BOAT, 16', 60-hp Ford V-8 eng., all access., \$425. FR 0-2612. A

CHEVROLETS, Biscayne, 1958, 2-dr., 6-cyl. stick, r/h, \$750; Impala, 1958, r/h, 283 eng., 4-bbl. carb., convert., \$1050 OR 1-9315. A

WASHER & DRYER, Westinghouse, \$30 pr. EA 2-2510. A

CADILLAC, Coupe DeVille, 1961, air conditioned, full power equipped, \$3995 377-4207. A

CAR COOLER, Thermador, \$10; wire netting, No. 17 hvy. duty 1 1/2", 150' rolls, \$10 ea.; Weaver 2 1/2 power rifle scope w/Redfield mounts, \$15; asbestos roofing, 4, 5-aal., \$2 ea. PL 4-8142. A

TENT, umbrella-type, 9'x12' alum. poles \$25. AX 1-0025. A

CHEVROLET, 1950, 4-dr. sedan, \$100. OR 3-1543 after 6 p.m. A

PORSCHE, 1959, convert., good tires, \$2350. GR 8-8009 eveninas. A

LAWN MOWER, Sears, 4-cyl., \$45. 378-5348. A

MOBILE HOME, 8'x45' Kit, 2-bdrm., w/alum. awnings & carpet & attached 10'x40' cabana, furn., \$4250. DA 3-6029. A

SURFBOARD, Lyman, 3 stringers, 9'6", \$80; gossip bench, Early American, \$20; what-not shelf, 31"x36", 2 shelves & drawers, \$21. PL 6-7533. A

CHEVROLET, V-8, 1957, r/h, Powerglide, \$600. FR 5-5139. A

SIMCA, 1956, 4-dr., \$175; luggage rack, \$12; used brick, 150, cleaned, 4¢ pc. WA 5-3166. A

CHEVROLET, Impala, 1961, 2-dr. h/top, air cond., Powerglide, full power, \$2200; Hi-Fi speaker, Wharfedale W70, 3-way sys., \$135. 354-2695. A

MERCURY, 1956, 2-dr. h/top, r/h, auto., \$350; washer & dryer, auto., \$50 ea. OS 9-1868. A

T-BIRD, 1958, power brakes, steering & windows, w/w \$1800. 323-2754. A

IEEP, 1948, w/steel cab, heater, free-wheeling hubs, tow bar, \$750. DA 3-1509. A

FORD, 1935, coupe, r/h, rebuilt eng., \$275. 676-6930. A

SURFBOARD, 9', hand shaped, mahogany inlay strips, \$75. DA 9-6079. A

CHEVROLET, 1940, 4-dr., sedan, \$75. DA 4-3250. A

BANDSAW, Craftsman, 12" radius, assorted blades, \$50; table saw, Dunlap, 8", assorted blades & attach., \$20. HA 5-9532. A

CORNER LOT, over 12,600 sq. ft., in California City, \$300 down, \$30 mo., \$2950. 755-4396 eveninas. A

FORD, 1958, 4-dr., rebuilt V-8 eng. & auto. trans., \$700; bicycle, Schwinn Superior, 14 spds., \$90; Ford, 1959, 6 w/stick, \$800. 371-6775. A

DAVENPORT, 2-cushion, \$12. OR 1-1098. A

COINS, BU in tubes, 1960 P, \$1 a roll; 1959 P, \$1.50; 1959 D, \$1; coin books, set of 12 green, \$12. Box 1504. A

FORD, Fairlane 500, 1958, no trans., \$550. OS 9-2122. A

BOAT, 16' Hydrocraft runabout, with or without 75-hp Evinrude, \$490; motor, 75-hp Evinrude, \$550 or best offer; motor scooter eng. w/ 3-spd. trans., 5-hp Piqua, Sears, \$30; generator, 60 amp, 12 volt gas, water-cooled, \$25; diver's tank & regulator, Aqua, \$40. DA 5-2871. A

CHORD ORGAN, Silvertone 31 keys, separate Vibro speaker, \$125. 753-5704. A

REFRIGERATOR, Coldspot, 11 cu. ft., 10-yr.-old, \$30. FR 2-5461. A

CHEVROLET, 1955, 2-dr., 6-cyl., stick shift, \$460 or best offer. 837-1541. A

WANTED TO BUY

FORD, 1950-51 or Mercury, 1953-54, good condition. AX 2-5117. B

WASHING MACHINE, wringer-type. OS 6-1745. B

FOR TRADE

RIFLE, J. C. Higgins, model #30, .22 LR semi-auto. w/6x scope, trade for .22 LR pistol. Box 1505. C

FREE (to be given away)

GUINEA PIG & cage, full grown female. PL 6-0015. D

WEIMARANER, AKC, 6-yr.-old. FA 8-4243. D



LEARN TO SQUARE DANCE—The Square Jers, INK Square Dancing Club, proudly announce that starting August 19, a square dance class for beginners will be held, Monday evenings, 8 to 11 p.m., Hill Rancho, 15701 South Crenshaw, Gardena. Class ends September 9. Cost is \$1 a person. Pictured are Square Jers on a typical Monday night dance get-together. Says Commissioner Earl Lambrecht, "We invite everybody. It's easy, healthy and fun."

BOWLING LEAGUES FORMING

NRC winter season bowling leagues for day and night shift Norair personnel are now being formed and are slated to start during the first and second weeks in September, it is announced by Bill Myerson and Corinne Davis, commissioners.

Types of leagues, day, loca-

RENTALS OFFERED

APTS., 1 & 2-bdrm., carpets, drapes, all elec., built-ins, Lawndale, unfurn. from \$120 mo.; furn. from \$137.50 mo. 326-0474. E

APTS., 1 & 2-bdrm., unfurn., all elec., \$110 & \$145 mo. 371-5037. E

APT., furn., bachelor, full bath, utilities pd., close to Northrop, \$16 wk. TE 3-2512. E

APTS., 2-bdrm., unfurn., fireplace, h/wood floors, close to Northrop, \$97.50; pvt. balcony, 1 1/2 baths, no small children, \$99.50. PL 5-0630. E

HOUSE, 3-bdrm., 2-bath, Palos Verdes, carpets & drapes, built-ins, stone fireplace, patio, lease, \$270 mo. FR 2-5367. E

DUPLEX, 2-bdrm., wash room, newly decorated, over 900 sq. ft., fenced yard, \$115 mo. 757-6960. E

HOUSE, 2-bdrm., unfurn., Torrance area, adults only, no pets, gas or elec. stove connect., \$115 mo. by lease or monthly contract, w/water & gardening pd. GA 3-9203, OS 5-0829 after 6 p.m. E

HOUSE, 2-bdrm., \$90 & \$110; apts., 1-bdrm. unfurn., \$80; furn., \$95; bachelor, furn. w/utilities pd., \$80, near Northrop, disposals, tile kitchen, & bath OS 5-9695. E

CABIN, 1/2 mi. to Lake Arrowhead village, fireplace, kitchen bar & patio, \$45 wk. 379-2504. E

CHILD CARE OFFERED

CHILD CARE, w/light housework during office hours, salary open. Box 1506. G

CHILD CARE WANTED

ELDERLY LADY to live in, take care of 3 girls, 6, 4, 2, lite housework, room & board plus salary, must have references. 676-8417. A

PERSONALS

THANKS for the cards & visits during my illness. P. H. MAURER. L

SINCERE appreciation for expressions of sympathy & kindness during the illness & loss of my beloved husband. MARY YANCEY. L

RIDERS WANTED, 2 or 3, to New York City, leave Aug. 16, share driving & expenses. 876-4587 after 6 p.m. L

RIDERS WANTED, 1 or 2, to Nebraska, share expenses, leave between Aug. 28 & Sept. 5. OR 7-1792. L

FOR SALE OR TRADE

CEMETERY LOTS, 2, w/D.I.P., in Inglewood Park, Resthaven plot, \$1450; or trade on good Honda or fishing boat & motor. OS 5-3866. M

COUCH, w/custom-made cover, \$20 or trade for beige rug 10'x10' or 8'x10'. VE 8-6826. M

CHEVROLET, 1955, 2-dr., r/h, new tires, trans. & rear end. \$650 or trade for Volkswagon bus. FR 7-2160. M

tion and time as follows:

Monday, 6:25 p.m., mixed 5 handicap, 760 maximum, Tropicana, starting September 9.

Tuesday, 6:25 p.m., men's 850 scratch, Missile, starting September 3.

Tuesday, 6:25 p.m., mixed 765 scratch, Del Mar, September 3.

Wednesday, 6:25 p.m., men's 825 scratch, Tropicana, September 4.

Wednesday, 6:15 p.m., mixed 5 handicap, minimum 700, maximum 760, Missile, September 4.

Wednesday, 6:25 p.m., men's 5 handicap, 775 maximum, Del Mar, September 4.

Thursday, 4:30 p.m., men's 485 scratch trio, Del Mar, Sep-

tember 5.

Thursday, 6:15 p.m., mixed 5 handicap, 750 maximum, Missile, September 5.

Thursday, 6:25 p.m., mixed 4 (650 scratch approximately), Gardena, September 5.

Thursday, 6:30 p.m., mixed 5 handicap (Palos Verdes included), Southwest, September 5.

Night shift:

Wednesday (Thursday—1:30 a.m.), 485 handicap trio, Del Mar, starting September 11.

Thursday (Friday—2 a.m.), 485 mixed trio, Southwest, starting September 12.

Entry forms may be picked up at Personnel Activities.

Mariners to Show Movie

The NRC sponsored Girl Scout Mariners, ship 262, will present the surf movie "The Angry Sea," to be shown August 24, at 8 p.m. in the Leuzinger High School Auditorium.

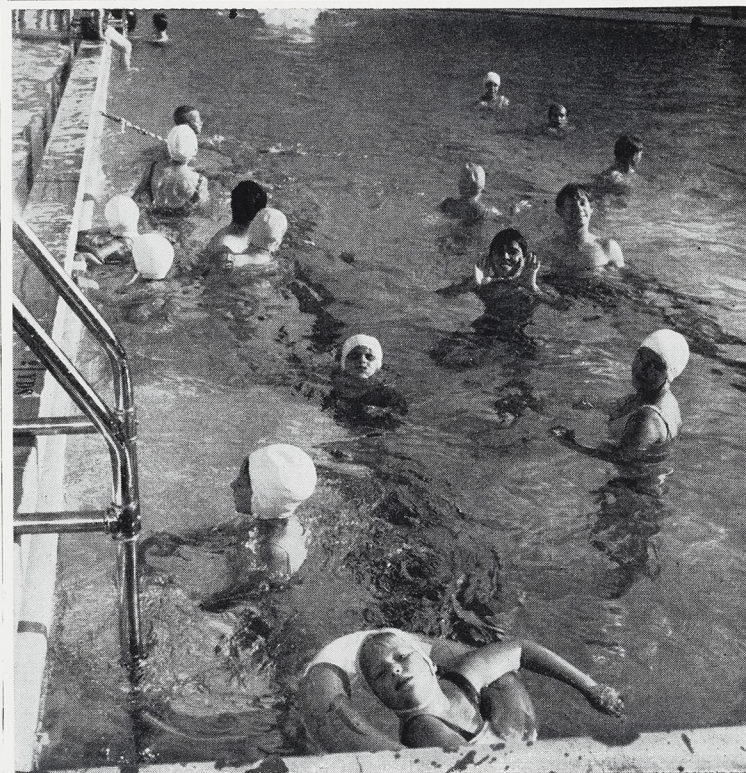
Cost is \$1.50 a person. Many door prizes.

Proceeds will help the young ladies raise funds for their many

worthwhile activities, Colorado River canoe trips for one.

The movie "The Angry Sea," filmed in color, contains exciting shots of Hawaiian, Californian and Mexican surf, featuring Waimea Bay, Sunset Beach, Banzai Pipeline and Haleiwa.

Limited number of tickets are available at Personnel Activities.



FUN IN THE SPLASH—Here's a good way to spend two free invigorating hours after work—take a swim! Again this summer NRC has arranged for exclusive use of the Leuzinger High School pool, between the hours of 4:45 and 6:45 p.m., Mondays through Thursdays until August 29. Bring a towel, bathing caps for the women.

NORTHROP NORAIR NEWS

Issued biweekly by Norair Division of Northrop Corporation

• Wednesday, August 28, 1963

HAWTHORNE, EDWARDS AFB, PALMDALE

SAN ANTONIO, EL PASO

LFC OUTSTANDING PROGRESS

SECOND X-21 MAKES FIRST FLIGHT TO EDWARDS



FLAG AWARD—Thomas V. Jones, left, president and chairman of Northrop Corporation, accepts in behalf of the Company and its 19,500 employees the U.S. Treasury Department Savings Bond Division's Minute Man Flag Award. Presenting the flag to Mr. Jones are W. C. Eller (center) state director of the savings bond division and R. V. Hughes, division area manager. Mr. Jones is the national chairman of the aerospace-aircraft industry 1963 Freedom Bond drive committee. Northrop Corporation employees achieved record participation of 99.6 per cent in their recent 1963 Freedom Bond campaign.

Webb Pilot Goes Over 1000 Hours in T-38

A little past 3 p.m., last Wednesday a T-38 Talon came in for a landing on the Webb runway and as the aircraft touched a milestone was reached by the pilot who was at the controls.

For that pilot—Captain David A. Hettinger—it meant a record.

By TSGT MIKE DE STEPHANIS
—from The Prairie Pilot

He had just winged his way past . . . 998, 999 and finally 1000 hours—the first pilot to chalk up that much time in the Talon.

Captain Hettinger's thousand hours started back in December 1961 when he went through the T-38 course at Randolph AFB. There he flew 40 hours and the rest he amassed here as an instructor pilot and as a wing standardization board officer.

The 28-year-old captain who is a 1958 U.S. Military Academy graduate said he would never have achieved this mark if it hadn't been for the maintenance specialists who keep Webb's aircraft in the best of flying shape.

He added that he had flown in everyone of the Talons based here. So his remark about the maintenance of the planes took on added importance.

Captain Hettinger had to get his 1000 hours Wednesday be-

cause he was leaving his job here as a member of the 3560th Pilot Training Wing Standardization Board for duty with Air Training Command and its Standardization Evaluation Board at Randolph.

(See Photo Page 3)

The T-38 record-holder's career in the Air Force began after graduation from West Point. He took his primary training at Malden AB, Missouri, and then came to Webb for his basic flying training.

After becoming a USAF pilot he became an instructor with the 3560th PTS. In August 1962 he was named to be a member of the Wing Stand Board.

As of Wednesday afternoon Captain Hettinger's flying time went to 2300 hours with 2050 hours flown in jet aircraft.

Captain Hettinger is the son of Mrs. John A. and the late Colonel Hettinger. His father was

(Continued on Page 3)

NO LABOR ON LABOR DAY

Northrop Norair facilities will be closed Monday, September 2, in observance of Labor Day, it has been announced by Corporate Vice-president and Division General Manager Dick Nolan.

Labor Day is a Norair paid holiday.

The second U.S. Air Force X-21 Laminar Flow Control aircraft left Hawthorne at 6:15 a.m. on August 15, with Don Papish at the controls for an uneventful flight to Edwards Air Force Base.

The first X-21 made its maiden flight last April 18. Both airplanes are now recording test flights which at presstime numbered more than 35, with approximately 96 hours in the air.

Don Warner, Northrop Norair manager, Laminar Flow Control Airplane Demonstration program in a News interview stated, "With the one airplane we have been averaging two flights a week. We have made as high as four. Our immediate Air Force test goal is to achieve optimum LFC results through selective wing configuration modification,

particularly leading edges.

"We are now well on the way to meeting contract specifications for percentage of wing surfaces covered by LFC. We furthermore



DON WARNER

expect to exceed the requirement by at least 10 per cent before the program is completed."

NO DOWN TIME

Mr. Warner paid high tribute to design and shop groups in converting the two B-66 aircraft to demonstration airplanes. "The new powerplant installations, all systems including fuel, electrical, and hydraulics, have performed without a flaw," he stated. "This gives the test team just that much more time to concentrate on Laminar Flow Control work."

The B-66 engines, readers will recall, were completely moved from an under the wing location to outrigger pylon installations aft under the horizontal stabilizer. This was done to provide a clean unobstructed wing area for demonstration of the Laminar Flow Control principle.

"It is a remarkable program," stated Mr. Warner. "Exceedingly successful so far. The fact that we have had no "down" time, and no system squawks whatever, is a workmanship credit to the entire Norair Division."

DR PFENNINGER

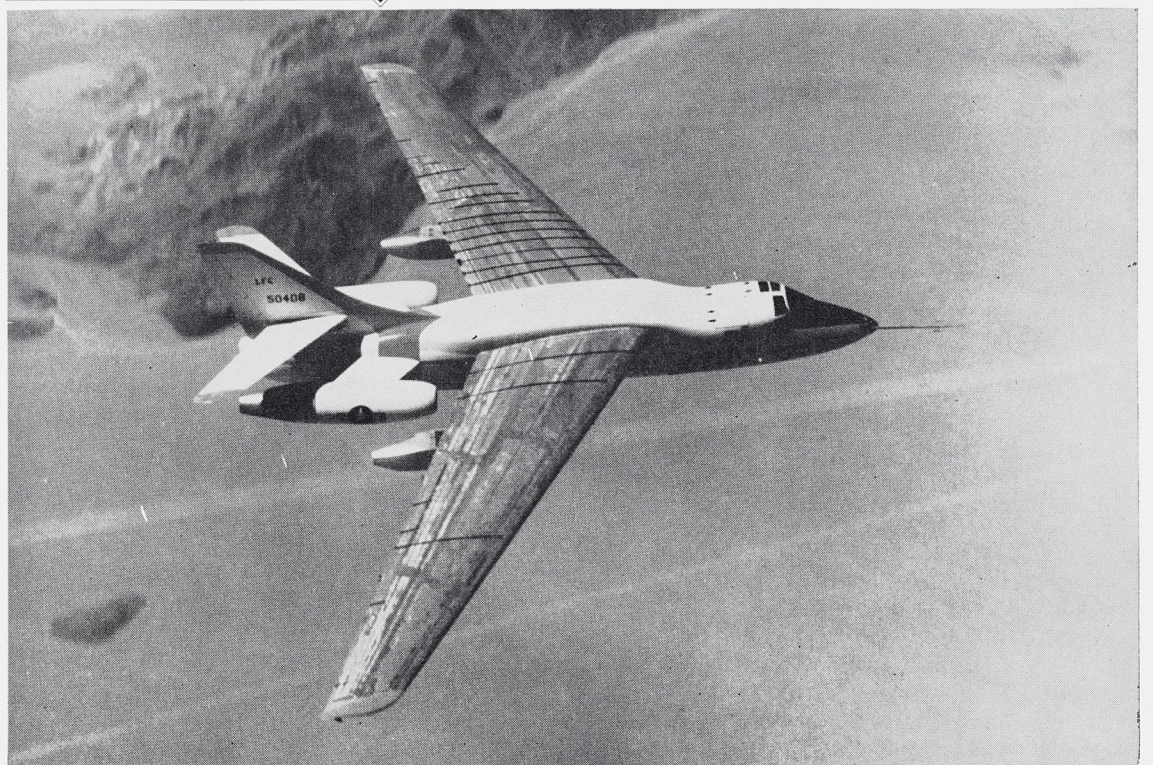
Dr. Werner Pfenninger, director, Boundary Layer Research, has also proved to be of inestimable value, Mr. Warner told the News. The internationally-known scientist is in constant attendance during and after flights, and each problem as it arises becomes a personal challenge.

The LFC project already promises to have a marked influence on future aircraft design. Although extensive wind tunnel work was done on the demonstration airplane wing configuration, it was found at Edwards after initial flights that a previously unknown and consequently unlooked for phenomenon occurred along leading edges of conventional sweptwing configurations wherein turbulent air shunts outboard before curling aft and "dumping" across the wing surface. This air "contaminated" leading edge flow and had the effect of breeding turbulence across the forward sections of the wing.

SCORES BREAKTHROUGH

The LFC scientific team scored what Mr. Warner terms a breakthrough when they discovered that slight changes, "bumps", in the radii of leading edges served to control this outboard movement of air, inducing it to be-

(Continued on Page 3)



LFC FLIGHT PHOTO OVER THE DESERT—Taken during test run at high altitude, photo shows X-21 at work on system performance. Note engines mounted aft. Pods under wings contain pumping equipment. Black marks running chordwise are part of instrumentation recording degree of Laminar Flow Control.

Jones Speaks on "Key to Growth"

The Society of Security Analysts invited our President Thomas V. Jones to address them in New York City on July 8. This important group is made up of financial men whose searching analyses of American business enterprises have become the criteria for millions of investors.

Forthrightly and with Tom Jones' traditional complete honesty, he brought to his hearers a report which has special meaning and significance to every man and woman who proudly wears the Northrop badge.



Citing management flexibility as "the key to growth," Tom stated, "Today's environment requires companies in our industry to invest more and more of our own money in capital facilities. At Northrop between 1958 and 1962 we invested over \$36,000,000 in new facilities for research and production, and the current fiscal year's expenditures will

specialized assignments. As the Skybolt experience illustrated, Northrop is not dependent on any single program. The largest single category of our business is electronics. Our wholly-owned subsidiary, Page Communications Engineers, has quietly doubled its volume since we acquired it in 1959 and it continues to grow.

"In the three months following Skybolt cancellation we had to reduce our work force by some 3300 people. We had to do this without cutting into our technical capability. We had to preserve those skills which would enable us to continue to compete. It was our determination to take each action in a way that would solve problems for our customers, not create them.

"We made these management decisions:

"We would reduce our work force by the required number and we would do it in a way which would make it possible to help most of our people find other jobs promptly, and

"We would preserve the technical skills of the Skybolt Guidance system in such a way as

By John B. Clark

Norair Director, Industrial Relations

bring this total to over \$50,000,000." These new facilities, he explained, have increased our capability to win new business, and they give our people better tools to work with, a better environment to work in, and at the same time bring cost reductions through greater efficiencies.

The improvement of our facilities made possible the hundred million dollar growth in our volume that took place over the past five years. Far more important, Tom stated, it represents an investment in future growth.

"The real strength of a company," Tom continued, "is in research. At Northrop, we are firmly tied to research. It is a way of life for us. It absorbs the energies of our most creative technical people. I cannot possibly list all of the research projects in which we are engaged, but I would like to mention some major systems which are in the final stages of company-initiated research, all in the center of specific defense and space needs.

"Believing as we do in the future of manned aircraft, we have been moving ahead with new airplanes employing advance concepts derived from the T-38 and the F-5. We have a space trainer, a manned aircraft that can train pilots for winged takeoff on flights into space. Projects like these are aided by our investment in modern wind tunnels. Our high speed wind tunnel, one of the few in the country, with speeds up to Mach 14, has helped us in our work on a hypersonic re-entry vehicle."

Speaking of our current business, Mr. Jones stated, "About 92 percent is with the three military services and NASA. About 8 percent represents commercial sales, domestic and foreign. About a third of our business represents prime system responsibility, another third major subsystems, with the balance ranging over a wide variety of highly

to enable us to compete in areas which had been previously closed to us because we were fully occupied with the Skybolt program.

"To help those displaced by the cancellation, we initiated an active program to seek out potential employers. They brought the job opportunity to the individual with the result that a great number were quickly re-employed.

"What we can do, other companies in our industry can do, and it may be that the facts warrant a reappraisal of the ability of defense industry to adapt quickly to unforeseen changes. As an industry we are not as inflexible as many have supposed."

Mr. Jones spoke of Northrop's sales records, stating, "Northrop sales for the first nine months of our fiscal year, amounted to about \$258,000,000 and we estimate that for the full 12 months, despite the Skybolt cancellation, our sales will be up to last year's level.

"Looking ahead another year, our sales in fiscal 1964 will be higher than in the current fiscal year. This is based on the principal programs we now have in house."

Recent stories in national publications indicate that Tom Jones is increasingly regarded as an example of enlightened leadership in the American business world. I feel that his utterances in this speech confirm this growing public opinion. We all can understandably enjoy a feeling of confidence and security in the realization that a person of Tom Jones' stature is our Company president. With such leadership from the president's office, all that is needed is the teamwork of all of us to have our Company continue to prosper. Tom would be the first to admit that it is not a one man job. Let us support his management and human relations philosophies. The years ahead can be as bright as we wish to make them.

First T-38s Arrive at Vance AFB, Miss Oklahoma Makes it Official

Marking the arrival of T-38s at Vance Air Force Base, the Enid Daily Eagle, Enid, Oklahoma, published the following editorial.

The News reprints with permission and pleasure.

Three of the world's first supersonic jet trainers swooped down out of clear-blue skies around mid-afternoon Thursday to come to "roost" on their home base runways at Vance Air Force Base after a flight time of two hours and 45 minutes from Palm-dale, California.

Royalty, in the person of Cheryl Ann Semrad (Miss Okla-

homa), was on hand to greet the pilots—Major Allen R. Keith, Captain J. C. Trobaugh and Captain Ramon L. Koenig—and drape her royalty sash across the nose of the first T-38 Talon, saying, "all Oklahoma joins me in wishing you success this day as Vance goes supersonic."

The three supersonic "birds-of-the-air" represent the first of

some 80 T-38s which will be delivered to Vance on a weekly basis until the quota is reached.

Built by the Northrop Corp. at its Hawthorne, California plant, the T-38 Talon supersonic trainer is designed to span the gap in pilot training between trainer and combat aircraft.

Colonel Philip G. Hallam, deputy base commander at Vance, earlier in the week briefed Enid Rotarians on this "white rocket," explaining that a plane of its type was necessary as the outdated T-33, currently in use here, was wearing out and in need of replacement by a faster, later-designed aircraft.

The first Vance class to be trained in the supersonic T-38s will begin around December 10 and thereafter, in classes of 45, some 350 pilots will be trained at Vance each year.

Colonel Hallam informed Rotarians that the Air Force's safety record is 3.4 accidents per 100,000 flying hours, whereas Vance holds the enviable low record of 2.1 accidents for the same flying hours.

The T-38s have a top speed of around 850 miles per hour and a cruising range of approximately 1100 miles. Weighing only 11,500 pounds, the T-38 is about two tons lighter than the T-33 and is capable of a near vertical climb at the rate of 36,000 feet per minute, far outstripping the best in use during World War II.

It's good to see the Air Force assign this supersonic jet trainer for Vance use. It is evidence of the high value defense officials place on the worth of Vance in its pilot training program.

All Enid area residents join with Vance personnel in welcoming the T-38s and express sincere wishes that the fine safety record continues at its present high level.

—VIRGIL WELLS
(Norair Tech Rep at Vance is Clif Shelton.)

Norair Division Men in Key Roles in SAE Meet

A team of 10 Northrop Norair personnel, led by Welko Gasich, vice-president and assistant general manager, Technical, and Jack Mannion, manager, Manufacturing and Materiel departments, will fill key speaking and organizational positions in the 1963 National Aeronautic and Space Engineering and Manufacturing meeting, to be held at the Ambassador Hotel, September 23 through 27.

The national summer meet, sponsored by the Society of Automotive Engineers, will stress the inter-relationship of engineering and manufacturing, and provide valuable information for both technical and manufacturing people.

The conference consists of 23 engineering sessions, 18 manufacturing sessions, augmented by a field trip to Rocketdyne's Santa Susana Rocket Field Test laboratory and a student engineers program.

Mr. Gasich and Mr. Mannion both participated in conceptual and planning sessions for the meeting. Mr. Gasich is a member of the Program Planning committee and Mr. Mannion is a member of the Executive committee's Manufacturing forum.

Other participants from the Division: J. A. Van Hamersveld, chief, Material Sciences and Value Engineering group, is a member, Manufacturing forum—Executive committee.

TWELVE DAYS AT CHRISTMAS

John B. Clark, Norair director, Industrial Relations and Security, in an early notice has revealed that the two floating holidays for 1963 have been assigned to December 23 and 24.

This will provide a 12-day stretch counting the weekends and New Year's and Christmas for an uninterrupted holiday at the yearend.

Northrop people can now make their plans accordingly.

A detailed announcement will be published in November, Mr. Clark said.

NORTHROP NORAIR NEWS

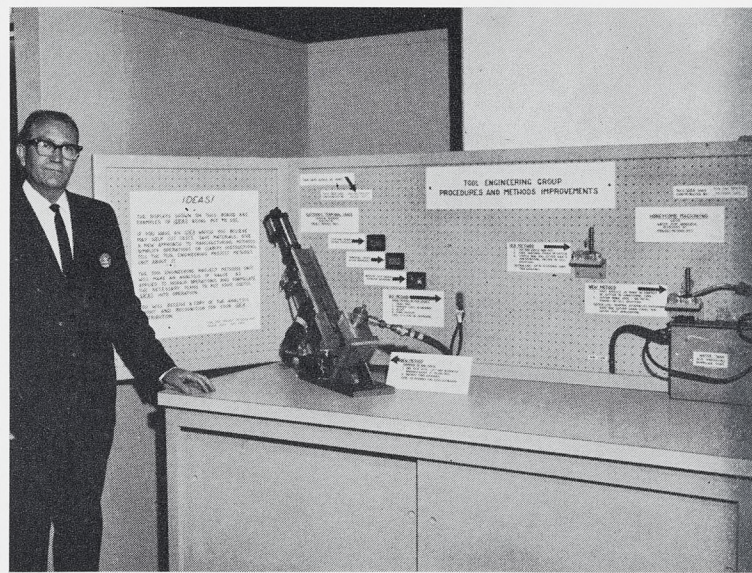
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CHARLES BRADFORD, Editor

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Better Way Display



USEFUL, VALUABLE IDEAS—First in a series of displays sponsored by Tool Engineering, Project Methods unit, designed to show usefulness and value of ideas contributed by Tooling personnel. Material for first display was developed by Roy Venable, tool engineer. It shows methods of removing terminal leads from electrical chip boards, and for extending work life of bologna slicers used to machine honeycomb core. Project Methods unit folk are available to help anyone develop potential of their idea. For display coordination information, call Jack Hathaway, supervisor, Project Methods unit, extension 2572. Displays are located in Tooling building.

First One Thousand Man



A THOUSAND HOURS—Captain David A. Hettinger, of Wing Stand Board, accepts a plaque for becoming the first pilot to fly the T-38 Talon a thousand hours from Dan Darnell, manager, Norair Customer Relations. Colonel Harold C. Collins, deputy for Operations, looks on. Captain Hettinger broke the thousand hour mark a week ago Wednesday afternoon.

Adhesive Bonding Played Vital Role in LFC Design

Adhesive bonding played a vital role in development of Laminar Flow Control aircraft, a Northrop Corporation engineer told the American Society for Testing and Materials.

Speaking at the Society's 66th annual meeting in Atlantic City, New Jersey, Henry F. Click, jr., senior materials engineer, Norair, said the LFC wing "would not have been possible without adhesives to bond together wing surface assemblies and internal members."

Built into the outer wing surface panels are plenum chambers, thousands of suction holes and a slotted exterior skin, all essential elements of the LFC system.

According to Mr. Click, the use of bonding not only facilitated fabrication of the wing, but also assured attainment of the external smoothness dictated by LFC aerodynamic criteria.

Fixtures used for Northrop's bonding techniques, Mr. Click pointed out, were female dies with wave-free surfaces milled in aluminum plate stock by numerically controlled milling machines.

"More than 90 different, contoured dies were used to bond wing surface assemblies for the X-21A wing," Mr. Click said, "and more than 100 standard, flat sandwich assemblies were bonded for the wing inner structures, including integral fuel tanks."

"Two primary structural adhesives qualified for use in the program: a nitrile-phenolic manufactured by Minnesota Mining and Manufacturing Company, Minneapolis, Minnesota, and a reinforced duplex nitrile-epoxy developed by Bloomingdale Rubber Company, Chester, Pennsylvania. More than 20,000 individual tests were made to assess the quality of our adhesive bonding techniques."

Wing panel bonding for the LFC wing was accomplished in three stages:

First, a panel assembly, consisting of the inner skin, FM-61 adhesive, honeycomb core, FM-61 adhesive, outer skin, .023 inch AF-32 adhesive, and .008

inch thick aluminum foil was placed in the bonding fixture with aluminum foil against the fixture and bonded at a pressure of 80-100 pounds-per-square-inch and a temperature of 350 degrees Fahrenheit. After cure, the aluminum foil was peeled off the assembly.

Secondly, plenum chambers were milled in the AF-32 adhesive and suction holes drilled through the bonded assembly. Then, the next assembly, consisting of the first assembly, .003 inch thick AF-16 adhesive, and the external skin was laid up. This assembly was placed in the bonding fixture with external skin against the fixture and bonded at the same pressure and temperature as the first panel assembly.

Thirdly, suction slots were sawed in the external skin. Then the final assembly, consisting of the bonded assembly, FM-61 adhesive and the spanwise stringers was laid up. This assembly was placed in the bonding fixture with external skin against the fixture and the stringers bonded at a pressure of 45-65 pounds-per-square-inch and a temperature of 350 degrees Fahrenheit.

In the LFC method, air is drawn through the slots, into plenum chambers, through the holes into plastic tributary ducts bonded to the inner structural skin, and finally into the spanwise ducts to underwing-mounted compressors that both suck the air into the wing and expel it aft.

1000 Hours

(Continued from Page 1)

killed in World War II action. His mother lives in Colorado Springs, Colorado, and he lists this city as his permanent home town.

**BUY
BONDS**

LAMINAR FLOW CONTROL

(Continued from Page 1)

come laminar and to pass directly over the wing where the system suction pumps could draw it through the slots and plenum chambers.

With this condition corrected, LFC results immediately improved percentage wise.

"Although we are demonstrating LFC, it is quite possible that our leading edge findings will serve a useful purpose on all aircraft," Mr. Warner said. He went on to pay compliment to R. E. Kosin, director, LFC Engineering section, and staff for their work in establishing correct leading edge dimensions to secure the high degrees of laminar flow being obtained to date. "Theirs is a major contribution," he stated.

Ability to change wing configuration for test purposes is a story in itself. The Norair science team is using "peanut butter" to do the job, "peanut butter" being the familiar term for a mouldable, bondable plastic that can be quickly worked into any shape, applied to wing surfaces, and safely withstand high flight speeds.

Pilots for Laminar Flow Control are Jack Wells, chief test pilot and Don Papish, supervisor, Production Flight Acceptance.

Just recently, the first Air

J-C Courses

(Continued from Page 1)

extent and criteria for qualification: courses are open to all employees; courses should be job-related or must contribute to the individual's efficiency in performing daily assignments.

Classes will be available at four junior colleges; Los Angeles Harbor and Trade-Technical, El Camino and Antelope Valley. Application deadlines are September 16, September 20, September 10 and September 9, respectively.

Courses offered include: Report Writing, Speed Reading, Elements of Supervision, Organization and Management, Written Communications for Supervisors, Supervisors Responsibility for Management of Personnel, Skills and Practices in Supervision, Industrial Economics, Work Simplification, Cost Control for Supervisors, Oral Communications, Basic Psychology for Supervision, Oral Communication Techniques for Industry, General and Industrial Psychology, Electronics, Business Machines and Typing.

Courses other than those listed may be taken if approved by Education and Training.

Part one of a three-part after-hours in-plant basic electronics course will be offered starting September 10 and continuing for 16 weeks, and is open to all Norair personnel. Manuals will be furnished. Enrollment began August 26 and will continue until maximum sign-up is reached.

It includes a study of basic elements of electronic circuits including essential elements of mathematics, plus studies in fundamentals of inductance, capacitance and resistance.

Edwards and Palmdale personnel should make course contacts through Tom Post, Industrial Relations, Palmdale.

Force pilot LFC Project officer Major Joe Schiele was checked out in the first X-21.

Northrop Norair Flight Test Engineering men, although seldom seen, are on the job day and night riding in the instrumentation cabins. They are Roy Whites, supervisor; John Bacon, Gene Jordan, Roger Wingert, and Bob Thomas.

Mr. Warner stated that most flights to date have been made at 200-235 knots (Mach .7 to .8) at 40,000 feet. "The Air Force has asked us to explore the entire altitude range of the X-21," he said, "from 25,000 to 45,000 feet at all useful speeds."

The X-21A project, as programmed by Northrop Laminar Flow Control Flight Test group, now that the airplanes have safely passed airworthiness checks will continue to conduct system performance surveys and performance optimization. They will also demonstrate improvement due to LFC and provide system operational evaluation.

The LFC system performance surveys will determine the degree of laminarization of the wing airflow which can be attained and the limitations, if any, imposed by lift coefficient, Mach number, Reynolds number, and aerodynamic and powerplant noise.

The second X-21A will figure prominently in noise research. Bullet microphones are being mounted strategically on wing surfaces to secure specific information on noise and areas of influence.

For selected flight conditions, the optimum suction distributions will be established.

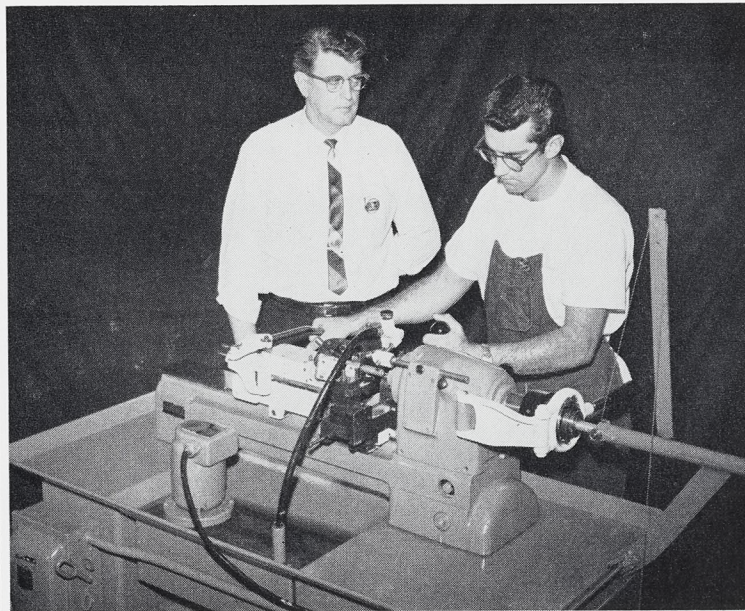
LFC operational evaluation will consist of specific tests to determine the effects on LFC operation of flight maneuvers, engine and suction system failures, and atmospheric disturbances such as turbulence, bugs, clouds, rain and ice.

In addition, the LFC system performance will be evaluated during a series of missions under simulated operational conditions.



PREDAWN—F. M. Keenan, chief, Eastern Office Aircraft Requirements, and X-21 pilot Don Papish, before daylight on the day of the first flight of the second demonstration airplane. Don took off at 6:15 a.m. Flight to Edwards uneventful. Both X-21s, although modifications were extensive (see story) have been free of squawks. No down time. A testimony to LFC team design and workmanship.

Cost Improvement



PIERCE PUNCH MAKER AT WORK—Tool and Die shop, organization 5216, has fabricated a semi-automatic attachment to fit a Hardinge lathe, enabling them to manufacture pierce punches, used in blank and pierce dies, at 37 per cent reduction under previous costs. Formerly, when punches had to be ordered in bulk lots, large storage area was required, handling costs were high. Now they are produced in size and quantity to suit individual job specifications. Photo shows Charles Pearson, shop foreman, watching James Whelan, jr., die maker, turn out punches on the specially equipped lathe.

ROGER, FIVE-BY-FIVE

QUALITY IS WATCHWORD OF NORAIR ANTENNA LAB

Sixty-six years ago, Guglielmo Marconi had an idea. Wireless sound transmission.

Today, such terms as "Roger . . . Read you loud and clear . . ." are significant of the advance-

By Jim Quick

Norair News Staff Reporter

ments over Marconi's first "wireless." They also represent basic application of radio wave transmission. Aerospace communication.

Modern day flight vehicle communication includes not only air-to-ground and ground-to-air transmission and receiving equipment, but navigation, identification, fire control, radar and terrain avoidance systems as well.

The key to successful transmission and receiving is the an-

tenna. Flight vehicles contain many different types, each performing a separate task, each with a different size, shape and design.

ANTENNA DEVELOPMENT

At Norair, antenna development is carried out in Technical's Engineering section, W. G. Stuart, director. Programs are handled through Electronic Systems group, of which F. L. Lyons is chief.

The Division's antenna range and support buildings at Van Ness and 120th Street, come under the jurisdiction of Communications and Navigation branch, D. H. Stephens, supervisor.

Function here is to design, locate and evaluate antenna systems; develop maximum efficiency required to obtain optimum transmitting and/or receiving range with minimum

size and power consumption.

There is also a 3000-foot microwave range in the Baldwin Hills area. This is used to evaluate antenna systems using microwave frequencies.

A new transmitter building has just been added at the main installation. The three-story steel and concrete structure houses recording instruments, and transmitting and receiving equipment. Mounted on top of the building, and on towers are airplane profiles and various other communications gear, the exotic sight of which is a matter of conjecture for passing motorists, Western Avenue golfers and Little League baseball players nearby.

Flight vehicle antenna design and development begins first with the establishment of vehicle mission. A preliminary antenna design and on-board location is then determined.

SCALE MODELS USED

Scale test models of the product, airplanes, missiles, capsules, are then made, and scale antennas installed. The model is then mounted on one of the above mentioned towers, and a transmitter is set to work beaming radio signals.

The model is revolved on its tower by remote control, while the field of radio energy "illuminates" the model and its antennas. The rotation causes variations in the signal received. The amplitude of the signal is read and plotted with respect to the angular position of the model.

Each plot represents a portion of the antenna's spherical radiation pattern. When all the plots are completed, these patterns indicate to the antenna design engineer the total volume of useful transmitting energy. Analysis tells whether or not the antenna configuration and vehicle location are adequate for the job.

FUTURE FACILITIES

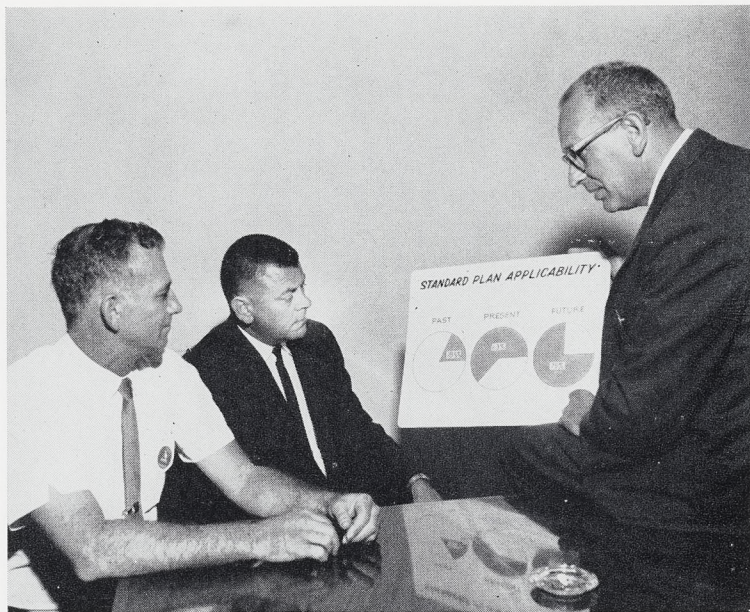
Additional facilities are planned in the future which will incorporate provisions for an anechoic chamber (microwave darkroom), impedance measurements, screen room analysis, instrumentation assembly, antenna prototype fabrication and design and data analysis.

Communications system poor quality can put an airplane in the hangar as completely as rough running engines, or faulty controls, or any other of the pesky gremlins that seem to plague crew chiefs, pilots and mission planners.

The antenna lab and its sophistication is an expression of Norair policy of second-to-none where technical quality of products is concerned.

When the pilot of a T-38 or an F-5 pushes the button and gets a sparkling undistorted response, he can thank Marconi quite naturally, but he also will know that Norair engineers and good equipment worked long hours to get the "garbled audio" out and the "five-by-five" in.

" . . . Good show, read you loud and clear, Charley . . . Heading for the barn . . . Roger—out . . ."



THEIR CONCEPT PAYING OFF—Norair men who pioneered Standard Plans method from left are Harold Smart, Tool Operation Planner, 5236; R. N. Mattson, general supervisor, Production Planning, and Charley Davis, unit supervisor, T-38 and F-5 Wing and Control Surfaces Planning. Procedure bids to save large sums on production contracts. See story for details.

SAE Technical Board Names Gasich for Three-year Term

Norair Vice-president and Assistant General Manager, Technical, Welko Gasich, has been invited by the Society of Automotive Engineers to serve on that group's Technical board for a three-year term beginning with the 1964 administrative year.

The invitation was extended by John T. Dymont, vice-president, Engineering, TransCanada Airlines and SAE president for 1964.

The SAE Technical board, a key group in furthering the aims of the Society, is dedicated to the objective of making knowledge, experience and skill of automotive and aerospace engineers on technical problems effectively useful to industry, government, and educational institutions.

Members are appointed on the basis of their personal qualifications and ability to contribute to the work of the Society. Experienced leadership is a strong requisite.

Other industry executives serving on the Technical board are:

E. P. Lamb, vice-president, Engineering, Chrysler Corporation.

C. C. Ross, vice-president, Engineering, Aerojet General.

D. B. Hammond, vice-president, Engineering, Willys Motor Company.

L. C. Lundstrom, director, General Motors Proving Grounds.

H. L. Mish, vice-president, Engineering, Ford Motor Company.

B. A. Schmickrath, engineering manager, Pratt and Whitney.

C. A. Lindblom, director, Engineering, International Harvester.



RADIO WAVE TARGET

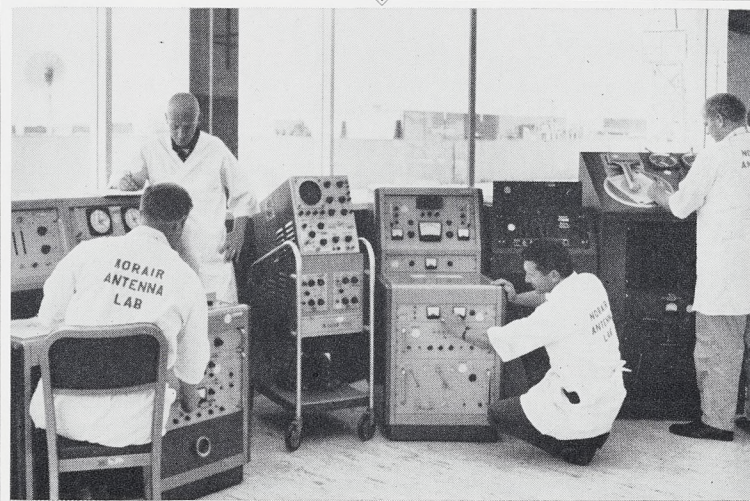
Model F-5 is mounted on 40-foot tower at end of antenna range at lab test site and rotated. Radio waves are beamed at it and its small internally mounted antennas pick up the signal.



NEW TRANSMITTING BUILDING — Recently completed transmitting building serves also as recorder and data reduction center. New are five-pattern ranges and recording equipment. This new range is used to design, locate and evaluate the communication, ADF, Tacan and IFF antenna systems on the F-5A and F-5B. Other work is being done on T-38 and Piaggio antenna research. Future plans call for anechoic chamber, impedance measurements, screen room analysis, instrumentation assembly, antenna prototype fabrication plus design and analysis.



ANTENNA LAB CREW — Men in Communications and Navigation branch, pause amid busy F-5 test schedules for News photo. They are, first row, left to right, Elmer Cain, Richard Knuckey, Joseph Spera, engineer; Jim Obbema, research assistant; and Robert Jaehnig, engineer. Second row, left to right, Frank Lyons, chief, Electronic Systems group; Douglas Stephens, supervisor; Robert Mushet, research assistant; Dick Swan, and Ralph Branning, supervisor, Electrical Instruments branch.



MASTER CONTROL PANEL—Located in new Antenna Lab transmitting building is modern transmitting, receiving and recording equipment used in precise aircraft communications work. Making final instrument check before test are, left to right, Dick Swan, senior engineer; Charles Olson, associate engineer; Elmer Cain, engineering specialist and Richard Knuckey, engineer.

New Planning Way Aids Norair Cost Improvement

Norair Production Planning has made a significant step forward in elimination of thousands of repetitive paperwork steps in processing parts for fabrication, it has been announced by Jack Mannion, manager, Manufacturing.

Titled "Standard Plans," the new method of planning is expected to score heavily in cost improvement, accuracy, and control. It is applicable to any vehicle from supersonic fighters and trainers to Mars probes.

"Standard Plans," stated Mr. Mannion, "means that we have researched hundreds of operation sheets to typify and classify parts as to planning steps. Whenever sequence permits, we have standardized and created coded manufacturing plans. Now after a series of preliminary runs it is apparent that Standard Plans will eventually apply to 75 per cent of our factory effort. This would translate into \$200,000 saved on a project of T-38 magnitude.

"I wish to compliment personnel in the Tool Engineering group, A. S. Turner, chief; and specifically to those in the Production Planning branch, R. N. Mattson, general supervisor.

"Standard Plans is a resourceful, efficient approach to an im-

portant but time-consuming phase of manufacturing."

ning operations sheets to 63 per cent. The goal of 75 per cent will cover all but the very special and one time jobs.

A Standard Plan is a sequence technique in manufacturing operations that can be applied to many different but genetically similar parts. As an illustration, all skins undergo generally the same planning steps. Likewise: brackets, gussets, circumferentials, hundreds of others. Previously planners painstakingly listed each step. Under Standard Plans part families are code numbered as to family and with planning sheets printed ahead of time with all common operations and sequences already listed. The planners then have only to fill in operations peculiar to the individual part.

To further illustrate, Standard Plan Number 1001, tubing, under previous planning methods required 102 entries on an average. These entries covered rough saw, burr—2 ends, bends—4, degrease, mark, saw trim, burr—1 end only, assemble "B" nuts, test, H and hand clean, mask, paint, label—2, identify cap and package.

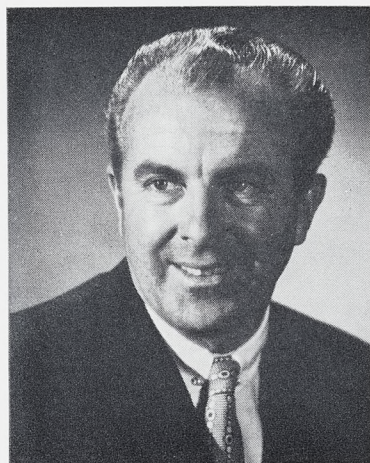
Under Standard Plans it has been found that 74 of 102 entries are common to all tubing operation sheets with only 28 entries mostly in the time standards area, to be added by the planner. Savings, 73 per cent.

Standard Plans generally start at raw stock and continue until part completion. Certain assemblies are also adaptable to the method such as hydraulics, cables, and electronics.

For a typical distribution of savings areas, see pie chart below.

Complete coverage is the goal for the following factory areas where Standard Plans are readily adaptable and in some cases with a 100 per cent potential:

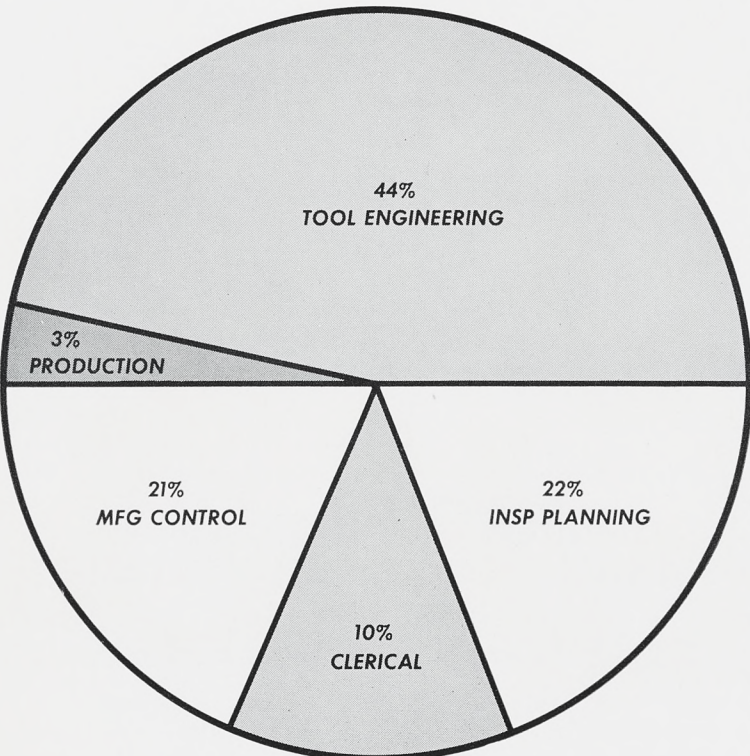
Machine Operations, Welding shop, Chem-Mill unit, Sheet Metal shop, Metal Bond shop, Advanced Production, Subassembly, plus the aforementioned Hydraulics and Cables and Electrical Subassemblies.



JACK MANNION

portant but time-consuming phase of manufacturing."

Mr. Mannion said that standard planning in the past three months has moved up from being utilized on 18 per cent of plan-



STANDARD PLANS — Pie chart shows typical Standard Plans savings distribution between the various Manufacturing elements.

THE NORTHROP CREDIT UNION

House that Payroll Deduction Built

Over 8000 Northrop employees are members of a multi-million dollar organization whose quiet operations are largely unseen, but which have assisted countless individuals to accumulate savings, buy a car, improve their home or obtain cash in an emergency. The source of all these good things is the Northrop Credit Union, Walter T. Gage, treasurer, chartered by the State of California and owned and managed by Northrop personnel independently of the Company.

Physically located at Norair in Plant One, the Credit Union serves all employees in the corporation, except Northrop Ventura, Nortronics' Precision Products and Marine Equipment departments, and Northrop Architectural Systems.

LESS RED TAPE

Operating through weekly payroll deductions and offering less red tape and lower costs, the Credit Union has been warmly received by the employees, who

maximum, whichever is least. For a used car, you may borrow 90 per cent of the wholesale price for late models, graduated downward for older cars.

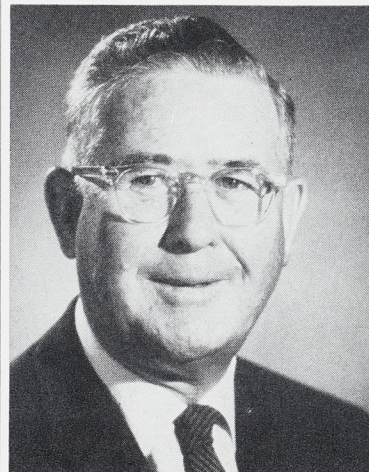
Cost for auto loans per \$100, repaid in one year, is \$5 for a new car and \$6.50 for a used car. The cost at most other lending agencies would be \$5.50 and \$7.

For home improvement loans, you may borrow up to \$3000, repayable in five years. You are eligible for such a loan after only three months employment at Northrop, and wives or husbands are acceptable as co-signers. Cost of borrowing \$100 to be repaid in one year is \$5 at the Credit Union and up to \$7.50 from other agencies.

Current policy for personal loans, i.e., loans unsecured by collateral, permits you to borrow as much as \$600 on your signature alone, after three years of employment. Typical amounts obtainable are \$50 with less than one month's service, \$75 with

fund as required by law and the balance is distributed to members in the form of a dividend.

The board of directors recently declared a 5½ per cent dividend for 1962, based on profits of



WALTER T. GAGE

\$104,915.41. The dividend period ends November 30 of each year.

Right now, some 4408 loans of all types are outstanding for a total of more than \$2 million. The average loan is for \$465. Since 1946 there have been 93,647 loans for a total of \$25.3 million and the loss ratio has been a phenomenal .0028 per cent.

The amount of money handled, clearings, since the Credit Union has been in business is in excess of over \$145 million.

FIVE DOLLARS

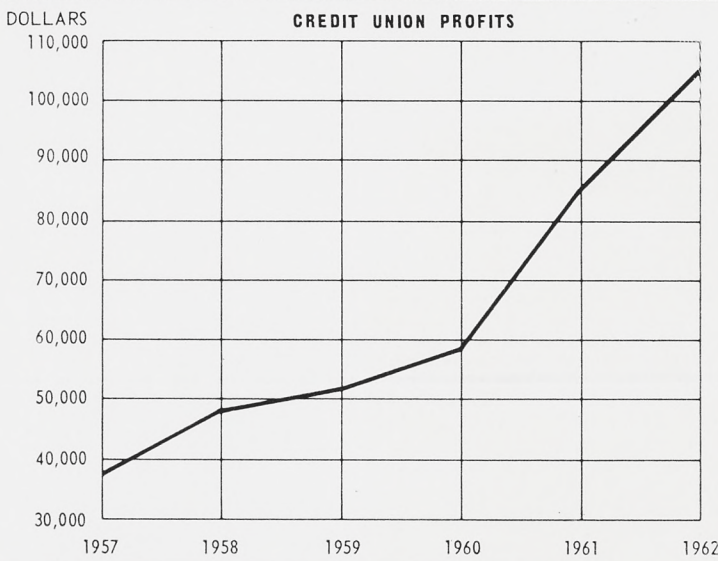
Anyone may join the Credit Union by depositing \$5 or more, up to a maximum of \$5000. There is also an initiation fee of \$1. Membership entitles each employee to one vote at the annual stockholders meeting, but most members submit proxies which are voted by the officers of the Credit Union. The annual meeting is held the first Tuesday in February. The meeting elects a board of directors, a Credit Committee and a Supervisory Committee.

The Credit Committee, consisting of three members, inquires into the particulars of each proposed home improvement loan and investigates the ability of the borrower to repay and the purpose for which he will use the money. The Supervisory Committee, also having three members, arranges for an independent annual audit of the books and makes an annual report.

Mr. Gage reveals that the greatest demand for money during the year is the six weeks prior to the Yearend Holiday and the two weeks after New Year's. During that eight-week period in 1962-63, loans and withdrawals totaled \$1.7 million, an all time high.

Hundreds of employees have found that investing a small amount each week by having it deducted painlessly from their paycheck can add up to quite a nest egg, particularly at the high rate of interest paid in the last few years. There are currently 8095 depositors with an average of \$285 invested.

"The Credit Union is performing a real service," says Mr. Gage. "Saving by payroll deduction makes the difference for employees in being able to steadily accumulate cash that otherwise might just disappear in a thousand and one ways."



currently placed more than \$2 million of their savings on deposit. They have borrowed close to the same amount to pay for home improvements, automobiles, vacations, Christmas gifts and many other items. In fact, since the Credit Union began operations, a total of \$25 million has been borrowed.

Control of the Credit Union is vested in a board of directors, who represent the various elements of the employee work force. This year's board is headed by W. D. Schramm, president; R. D. Hampton, vice-president; and Mr. Gage, secretary-treasurer. Other members are Dick Carroll, chief of Industrial Relations, ES&E; and Norair men Lyle Cripe, Leo Richman and H. R. Watson. The board of directors determines the amount of the annual dividend and meets regularly to administer the business of the Credit Union.

THREE TYPES OF LOANS

Mr. Gage explains that the Credit Union offers three types of loans—auto, home improvement and personal. So far this year, there are 3231 outstanding personal loans, 922 auto loans and 255 home improvement loans. Rules for each type are different.

As with any lending agency, distinction is made between purchase of a new car and purchase of a used one. After three months employment at Northrop, you may borrow 70 per cent of the selling price of a new car, or the established credit union

three months, \$100 with six months and \$200 with one year. Minimum weekly repayment rates, by payroll deduction, run from \$3 a week for \$50 to \$9.25 for \$600. Length of the repayment period runs from 17 weeks for \$50 to 18 months for \$600.

Although length of service determines the amount you are eligible to borrow, this must be balanced by ability to repay. Refinancing of personal loans is permitted after six months of date of issuance of the original loan.

MARY DELANEY

Mary Delaney, assistant treasurer, says that one of the great advantages of Credit Union membership is that you pay interest on money only for the length of time you use it. If you decide to pay off all or any part of the balance, you may do so and cut your interest charges. Most other types of lending agencies prorate the carrying charges.

Should an employee terminate while having a loan outstanding at the Credit Union, he merely makes arrangements for repayment. He continues to receive the favorable interest rates open to employees.

Profits of the Credit Union have risen steadily over the past five years, as will be noted in the accompanying chart. After all expenses of operating the Credit Union are deducted from income, 20 per cent of the remainder is placed in a reserve



RIDES WANTED

7 a.m. — 3:45 p.m.

HAWTHORNE BLVD. & 190TH ST., Torrance. Betty Evans, ext. 1310. 2

7:30 a.m. — 4:15 p.m.

NARBONNE & PACIFIC COAST HWY., Lomita, Pat Goepfner, ext. 2401, DA 5-4528. 3

HONOLULU & BOSTON, La Crescenta. L. Robillard, ext. 4048, CH 9-0734. 3

8 a.m. — 4:45 p.m.

ADAMS & 7TH AVE. Los Angeles. Vanessa E. Nealy, ext. 1559, 734-0221. 5

ROSCOE & VAN NUYS, Panorama City. Lynda Witherwax, ext. 2521, 518, 364-2055. 5

SAN BERNARDINO FWY. & FREMONT, Alhambra. Harold N. Shonyo, ext. 1745, AT 2-9501. 5

RIDE OFFERED

7:30 a.m. — 4:15 p.m.

HONOLULU & BOSTON, La Crescenta. L. Robillard, ext. 4048, CH 9-0734. 13

8 a.m. — 4:45 p.m.

ROSCOE & VAN NUYS, Panorama City. Lynda Witherwax, ext. 2521, 518, 364-2055. 15

SAN BERNARDINO FWY. & FREMONT, Alhambra. Harold N. Shonyo, ext. 1745, AT 2-9501. 15

BBSF Classified Ads

BBSF classified ad service is provided free of charge to all Northrop Norair personnel.

Ads for agencies, commercial enterprises and private businesses are not accepted.

Deadline is noon Wednesday, one week before publication.

FOR SALE

IDOLS, Indian, stone-carved, sizes & prices vary, small faces, \$500. PL 4-3812. A

BICYCLE, boy's, 3-spd., Schwinn, 26", \$25. OS 5-6016. A

PUPS, 6-wks-old, AKC, beagles, \$35. FR 5-5171 after 5 p.m. A

HOUSEHOLD FURNISHINGS, chest of drawers, 8 drwr., \$20; innerspring mattress & springs, \$15; table lamps, 2, wall bracket, pull cord lamps, \$2 & \$3 ea. 327-8047. A

CORVETTE, 1954, orig., ena. rebuilt, 2 tops, good tires, \$1100 or offer. 375-7038. A

PLYMOUTH, roadster, 1932, new ena., spare parts, needs restoring, \$275. OS 6-6390. A

STAUFFER TABLE w/timer, \$75. OS 6-2162, OS 9-7230. A

CHEVROLET, 1954 sedan, 6-cyl., stick shift, \$65. PL 4-0078. A

TABLE, 6', benches, 2, contour lounge love seat, redwood, \$25; steel table, 42", round, w/umbrella, folding chairs, 4, \$40; lamps, 2, 33", 3-way switch, \$8. 375-4593. A

PLYMOUTH, 1954, r/h. \$125. 674-1672. A

MOTORCYCLE, 57 B.S.A., 650 cc, twin super rocket, \$550. 379-0015. A

TRIUMPH TR, 1959, \$995. 439-5819. A

DISHWASHER, GE, \$40. FA 1-1655. A

RIFLE, .270 FN Mauser w/4x Bushnell scope & adj. triaquer, 25 rounds of ammo inc., \$175; pistol, S&W K22 w/target triaquer & grips, \$50. DU 4-3603, EX 4-2077 after 7 p.m. A

FURNITURE, mahogany, table, corner, \$10; coffee table, \$5; end table, \$5; chrome table, 4 chairs, \$20. OS 5-2305. A

DOLLS, 4, Chatty Cathy's, extra clothing, \$4.50 ea.; \$15 for all. 374-1205 after 5 p.m. A

IMPALA, 1959, convert., p/brakes & steering, Powerglide, \$1100. TO 6-3349. A

STEREO TAPE DECK, Webcor, \$75. FR 1-2531 after 5 p.m. A

PUPS, beagle, male & female w/papers, \$35 ea. OS 5-6883. A

WASHER, comb., gas dryer, Bendix CVC, \$125. FR 8-3990. A

CHEVROLET, Impala, 1958, convt., \$995; stove, apt-size, gas, \$35; bedroom set, \$75; recliner chair, leather, \$75; end tables, 2, coffee table, \$20; fireplace set, \$45; lawnmower & edger, \$100; table saw, 10", \$100; lathe, 8", wood, \$20; German shepherd, 2-yrs-old, male, \$25. FA 8-1973. A

SAILBOAT, 8' 2-yrs-old, bronze fastened sebot. all equip., \$150. FR 5-5629. A

TEMPEST, Le Mans, 1962, convert. auto. trans., r/h, bucket seats, \$2000. 671-7147 after 5 p.m. A

FOR SALE

FORD, Fairlane 6, 1961, 2-dr sedan, stick shift, \$400 plus take over \$47.98 payment for 18 mos., \$800 approx. bal. 325-2042 after 5:30 p.m. A

AMPLIFIER, Heathkit stereo, Model AA-151, fully assembled, \$75. 370-2456 after 5 p.m. A

HOUSE TRAILER, 30'x8', 1948, new roof, forced air oil heater, \$350. 324-7174. A

FORD, 1955, 4-dr., auto. trans., \$375. OR 1-3193 after 5:30. A

RANGE, 3-mo-old, \$60. Box 1601. A

RUNABOUT, 15', 35-hp Evinrude, 3 life jackets, trailer, other access., \$400. OS 6-6360. A

BICYCLE, 10-spd., Schwinn, carrying rack & lock, \$80. TO 1-4685. A

TEMPEST, 1962 coupe, r/h, stick shift, \$1500. 323-7903. A

PONTIAC, 1953, dual range Hydromatic trans., \$47. 379-4092. A

CAPTAIN'S CHAIR, \$20; Russell Wright dinnerware, service for 6 inc. spares & 6 crystal water goblets, \$30; floor scrubber/polisher/waxer w/attach., elec., \$35; dinette chairs, 2, \$6 ea. 378-0094. A

BEDROOM SET, black, Hollywood-style, \$45. NE 8-3836. A

GO-KART, 2 racing slicks, 3-hp motor, \$50 or best offer. DA 9-5364. A

REFRIGERATOR, Servel, gas, 9 cu. ft., cross-top freezer, \$40. FR 5-9985. A

FURNITURE, bedroom set, 5-pc., silvered walnut, \$65; writing desk, blonde ash, 23"x54", \$55. OR 7-3788. A

WASHER & DRYER, sep. units, Marquette, \$225 ea. or \$400 for both. DA 9-5879. A

SECTIONAL, 2-pc., \$10; chair w/ottoman, \$10; crib, \$10. 326-5874. A

REVOLVER, .38 Colt police spec., Frontier model, w/dble-action, 6" barrel & holster, \$55. OS 6-4915 after 4 p.m. A

DINETTE SET, Provincial maple, dropleaf table, 4 chairs, \$30. DA 5-4872. A

BICYCLE, 1-wheel, hvy-duty, \$25. OS 5-0279. A

RANGE, gas, 36". O'Keefe & Merritt, \$40. OR 8-8078. A

BUICK, Riviera Roadmaster, 1955, full power, new brakes & drums, \$395. FA 1-0020. A

TRAILER, 11', teardrop-type, Coleman stove, ice box, sleeps 2, \$85. FA 8-3306. A

T-BIRD, 1960, sunroof, h/top, full power, \$1995. DA 6-5558. A

JET PUMPS, 1-hp, used approx 600 hrs., \$50; table saw & motor, \$17.50. VE 7-4237. A

CABIN CRUISER, 21', Owens, 150-hp Gray marine inbd., \$1995. 343-0464 after 5 p.m. A

TRAILER, teardrop-type, butane, sleeps 2, \$100. OS 6-7366. A

OLDSMOBILE, 1956, p/brakes & steering, \$400; Ford, 1957, p/steering, \$400. FR 5-0061. A

HOUSE, 3-bdrm., 1 1/4 baths, built-ins, carpets & drapes, financing, 10% dwn., \$25,950. TE 3-3036. A

SURFBOARD, Dave Sweet, 9', \$70. PL 6-9453. A

ACCORDION, Universal, 120-bass, 3-switch w/new carrying case, \$75 or make offer. 674-1847. A

CORVAIR, 1960, 2-dr., r/h, auto. trans., \$1050. FR 9-6824 after 6 p.m. A

MGA, 1959, w/wire wheels, 4-spd. trans., \$200 equity & take over \$850 balance. 322-3404. A

DODGE, 1952, good trans., \$75; Ford, Model A, 1930, \$175; engine, Oldsmobile 88, 1955, \$50. Box 1602. A

RENAULT Dauphine, 1958, r/h, seat belts, 2 new w/w tires, \$295. FR 1-1953. A

WINCHESTER, 30-30, model 94 w/2 boxes of shells, \$50; shotgun, 12 ga., dble barrel, \$35. DA 4-2847. A

MOVIE CAMERA, 8mm, De Jur, 3 lenses, zoom viewfinder, 5-spds., \$35. PL 4-6428. A

PLYMOUTH, 8, 1960 4-dr., automatic transmission, \$806. Credit Union, station 617. A

HOUSE, 4 bdrm., 1 1/4 bath, built-ins, forced air, water softener, disposal, dishwasher, sprinklers, awnings, carpets, drapes, pool, heater, \$21,500. Fullerton 714-LA 6-6256. A

WANTED TO BUY

TABLE & benches for patio, ping pong table, shuffleboard equip. OS 9-6982. B

CEMENT MIXER, small, reasonable. FR 7-3487. B

DINETTE SET, maple, will pay \$30 max. FR 1-6894. B

FILE CABINET, wood, 4-drwr. FR 2-3827. B

FREE (to be given away)

PARAKEETS. OS 6-0041. D

RENTALS OFFERED

CABIN, Big Bear Lake, furn., 2-bdrm., fireplace, walk to village, sleeps 9, 10% discount to Northrop employees, \$65 wk. DA 6-1173. E

APTS., 1-bdrm., furn., built-ins, heated pool, \$125; 2-bdrm., unfurn., \$130; 3-bdrm., 2 baths, unfurn., \$150. OR 1-7196. E

September in Bid for NRC Ballot Month

September bids fair to become Northrop Recreation Club election month. Thirteen clubs have scheduled annual balloting to select commissioners for the forthcoming year's activities.

Meeting dates, times and locations:

Toastmasters, September 5, 6:30 p.m., at the Cockatoo Inn, Hawthorne.

Sports Car Club, September 10, 7:30 p.m., at the NRC Clubhouse.

Gem and Mineral Club (days), September 11, 7:30 p.m., NRC Clubhouse.

Sea Anglers, September 17, 7:30 p.m., NRC Clubhouse.

Knitting Club, September 18, 7:30 p.m., NRC Clubhouse.

Square Dancing, September 20, 8 p.m., at Hill Ranch, 15701 South Crenshaw.

Skin Diving, September 17, 7:30 p.m., NRC Clubhouse.

Coin Club, September 23, 7:30 p.m., NRC Clubhouse.

Stamp Club, September 23, 7:30 p.m., NRC Clubhouse.

Symphonaires, September 24, 7:30 p.m., Hawthorne High School, building 2, room 4.

Camera Club, September 24, 7:30 p.m., Les Laucks, 17234 Eastwood, Torrance.

Art Club, September 26, 7 p.m., Joe Kalina's studio, 3234 West 157th, Gardena.

Riding Club, September 29, 4 p.m., NRC Clubhouse.

And for October:

Surf Fishing Club, October 1, 7:30 p.m., NRC Clubhouse.

Camping Club, October 2, 7:30 p.m., NRC Clubhouse.

Hikers and Packers, October 10, 7:30 p.m., NRC Clubhouse.

Gem and Mineral (nights), October 16, 12 noon, NRC Clubhouse.

RENTALS OFFERED

HOUSE, 1-bdrm., furn., \$80; 2-bdrm., unfurn., block to beach, w/garages, \$125. FR 9-1357. E

HOME, 2-bdrm., unfurn., Torrance area, adults only, no pets, w/w carpeting, kitchen w/connection for gas or elec. stove, lease or \$115 mo. GA 3-9203 after 5:30 p.m. E

GARAGE APT., furn., 3 rooms, utilities paid, \$95 mo. DA 9-6351. E

APTS., 1-bdrm., new, ultra-modern, pool, patio, Lawndale, from \$120. 326-0474. E

HOUSE, 2-bdrm., children OK, no pets, 10 min. from Northrop, \$116 mo. OR 1-6485 after 6:30 p.m. E

CHALET, Mammoth Mountain Lakes resort area, 6-bdrm., 2 baths, sleeps 18, fireplace, sun deck, furn., June-Nov., \$125 wk. plus \$25 deposit. TH 2-8205 evenings. A

HOUSE, 2-bdrm., unfurn., garage, tile kitchen & bath, \$110; apts., 1-bdrm., unfurn., \$80; furn., \$95; bachelor, furn., utilities pd., near Northrop. \$80. OS 5-9695. E

HOUSE, 2-bdrm., 2 small children OK, no pets, \$85. 371-6775. E

RENTALS WANTED

HOUSE or unit, 1 or 2 bdrm., unfurn., small or no yard, need by mid-Sept. DA 7-9934. F

CHILD CARE OFFERED

CHILD CARE, licensed, 2 yrs. to first year of school, references, \$15 wk. OS 5-1884. G

PERSONALS

WE WISH to thank our many friends for their extended sympathy & thoughtfulness during the illness & passing of our beloved husband & father. RAMATH GOODWIN & SONS. L

THANK YOU for the many cards & kindnesses during my husband's illness & passing. MARJORIE FUNDER & FAMILY. L

OPENING for 1 person to obtain private pilot's license as member of group of students w/own aircraft. FR 7-3810 after 6 p.m. L

Management Club Honor



MUG-OF-THE-MONTH—Management Club, at their August 2 dinner-meeting, presented Louise Hobson, center, supervisor, Telephone and Telegraph unit, with the "Mug-of-the-Month" for outstanding service to Norair and the Management Club. Says Ed Laski, president, "Louise was given the award for her work in training men and women in the telephone complex to work with a high degree of efficiency and she was an officer of the Club, and chaired the committees which always produced fine jobs. We in M-C are proud to be associated with her." Looking on are Lead Telephone Operators Shirley Markley, left, and Opal Payne. Leo Richman, forum chairman, coordinated and made the presentation.

Hawaiian Motif Setting For Special Travel Club Meet

Additional facts, and figures, are in on the upcoming Hawaiian trip meeting being staged by the NRC Travel Club.

There will be hula girls, Hawaiian music, door prizes from the Islands, orchids for the ladies. All in the exotic setting of the Polynesian Restaurant's plush tropical gardens.

Date and time, September 12, Thursday, 7:30 p.m.

All Northrop personnel are invited.

NRC DANCE CLUB TO START NEW CLASS SERIES

Hank Solak, commissioner, Ballroom Dancing Club, invites all Northrop personnel to attend a new series of dance instruction classes, beginning September 12 at the NRC Clubhouse, 12917 Cerise Avenue, Hawthorne.

Instruction is to be divided into three segments. Classes will meet on Thursdays for a period of 10 weeks. Cost is \$10 a person for the series.

The first class meets from 7 to 8:30 p.m. for mambo and tango instruction. The second meets from 7:45 to 9:30 for the tango and fox trot. The third meets from 8:45 to 10:30 for fox trot and rumba.

Singles or couples are welcome.

Bill Martin will instruct. He uses the group method of teaching, allowing new partners at consistent intervals.

Top Norair management has been especially invited.

Dress is strictly informal, including muu muus and aloha shirts.

Details of Northrop's 12-day year-end holiday trip to Hawaii will be discussed, including the headline possibility of chartering a 707 jet for the trip. This paradoxically would reduce the package price even more, from \$338 to \$298.

The Polynesian Restaurant is located at 3901 West Pacific Coast Highway, just west of Hawthorne Boulevard in Waltheria.

For further information, call Don Kohler, Personnel Activities office, extension 2784.

ICE FOLLIES AT DISCOUNT PRICES

Discount tickets to Shipstads & Johnson's Ice Follies at the Los Angeles Sports Arena and Long Beach Arena are now available to all Norair personnel.

Performances are scheduled for September 6 through 12, and 14 through 16 at the Sports Arena; September 18, 19, 21 and 22 at the Long Beach Arena.

Tickets may be ordered by special envelope, available and ready for mailing at Personnel Activities.

Regular reserved seat prices for Ice Follies are \$4, \$3.50 and \$3. Norair discount price is \$1 less on all. Special children's tickets also available.

NRC Fun Fair PICNIC EXCITING! DIFFERENT!

All For Fun and Fun For All

Games — Contests — Free Refreshments

Prizes—not just little ones but a big one, too—a free trip to the stars for two via the Satellite Las Vegas

Watch for Announcements

Reserve Sunday, Oct. 13 for your interplanetary travel

NORTHROP NORAIR NEWS

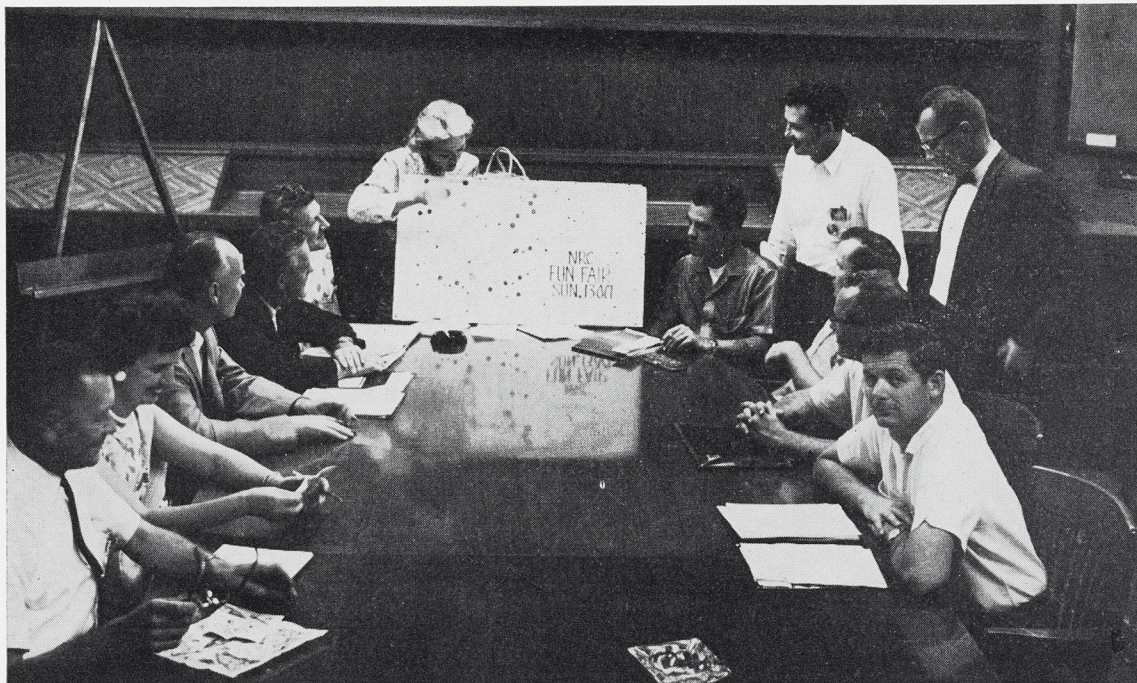
Issued biweekly by Norair Division of Northrop Corporation

• Wednesday, September 25, 1963

HAWTHORNE, EDWARDS AFB, PALMDALE

SAN ANTONIO, EL PASO

Fun Fair Launching Committee



FUN FAIR PLANNERS—Fritz McClarney, chairman, NRC special events, holds forth during committee planning session for upcoming NRC fun fair. From left, Don Kohler, Personnel Activities; Della Anderson, Kenneth Anderson, Dave Carney, Nick Stang, Nortronics; Fritz, Wayne Ovette, Bernie Doyle, NRC president; Bob Taafee, Dick Pryor, general supervisor, Personnel Activities; Byron Pierce, and Jack Wilson. Not in photo, Bill Wareing, Ross Kongable, Howard Butler, and Earl Bird, Nortronics. NRC fun fair now well in orbit will be held at South Gate Park, Sunday, October 13. Plan a family rendezvous. Grand fun fair prize for the day—trip to Las Vegas.

FUN FAIR FLASHES

WHO: All "planets"* of Northrop galaxy.†
WHAT: The NRC Fun Fair.
WHEN: Sunday, October 13, 10 a.m. to 5 p.m.
WHERE: South Gate Park.
WHY: To have the best time you ever had in your life.

Bill of particulars—Norair and Nortronics are jointly going all out, way out, even past the twilight zone to provide a fun day for Northrop families.

Strap the future astronauts in the family capsule and be there early, says the NRC's special events committee. No need to pack anything except your enthusiasm. There will be Martian space age lunches (with fried chicken yet) for only \$1.

Entertainment will include the "Planetary" Pendleton's (Paul Comb's combo), the "orbiting" Orth Brothers and Bob Taafee, the "Venus vocaleer," not to mention all kinds of space age picnic fare such as games and contests with a universe of prizes.

Some lucky member of the Northrop team will receive a trip for two to Las Vegas.

Space lunch tickets are now available at Personnel Activities. Call extension 2784.

A map of how to get there will be published in the next issue of the Northrop Norair News.

*Planets means divisions.

†Galaxy means corporation.

MANAGEMENT CLUB ANNUAL DINNER DANCE SET FOR AIRPORT-MARINA

The Northrop Management Club will hold their Annual Dinner Dance, Saturday night, October 5, at the Airport-Marina Hotel, it has been announced by President Ed Laski.

Manny Harmon and his band will entertain. There will be many prizes.

Price is \$6 a person.

Tables are round. Mr. Laski advises and will seat 10 people. Places will be available for couples not filling a table of their own.

The dance is not limited to members of the Club.

Reservations will be mailed.

Cafeteria Now Must Collect 4% Sales Tax

Norair cafeteria patrons began paying the State sales tax of 4 per cent on food, as collected in regular restaurants, last Friday, September 20.

Assembly bill, passed during the recent session, eliminated the former special clause exempting Company-owned cafeterias from this levy.



(USAF PHOTO BY BELTRI)

REPRESENTATIVE FLIGHT — Congressman Pat Martin, California District 38, Riverside and Imperial Counties, receives congratulations of Northrop engineering test pilot Dick Thomas, at the conclusion of his indoctrination flight in a Northrop T-38 Talon jet trainer at Andrews AFB, Washington, D.C. During the flight, the Congressman—a very competent civilian pilot in his own right—took over controls to 'feel out' the sleek training craft.

MAJOR JOE SCHIELE NAMED X-21 PILOT

U.S. Air Force Major Joe S. Schiele has been named Air Force project pilot for Northrop Corporation's X-21 Laminar Flow Control aircraft undergoing flight tests at Edwards Air Force Base.

A veteran bomber and transport test pilot, Major Schiele has flown more than 35 aircraft and logged 5000 hours of flight time during his 17 years with the Air Force. The B-29, C-130, and KC-135 have played prominent roles in his career.

Medical Has Flu Shots At No-Cost

Northrop Norair Division again this year is presenting a no-cost influenza vaccination service for all personnel.

The first phase of the program got under way this week throughout all facilities. A second round of shots will be given in November.

Norair Medical reports 70 per cent effectiveness for the vaccine against Asian flu and some of the other more common types of the disease. Basic immunization consists of two injections taken six weeks apart with yearly boosters. People who took the course last year, need only one shot this time.

Initial clinics have already been held in the Hawthorne plant area with return dates set for September 27 and October 4. NSL and the Johnson facility are scheduled for today. Corporate office and Mariposa tomorrow.

(Continued on Page 2)

The X-21, built by Norair Division for the Air Force Systems Command, is testing friction drag-reducing Laminar Flow Control system under operational conditions. The Northrop-developed



oped LFC system promises to increase range, payload or endurance of future combat and transport aircraft by 50 per cent or more.

Major Schiele joins Northrop pilots Jack D. Wells and Donald H. Papish who have flown more than 30 X-21 test flights and will remain in the test program.

Major Schiele holds a B.S. degree in mechanical engineering from Louisiana State University and M.S. degree in aeronautical engineering from Purdue University under the Air Force Institute of Technology program.

He resides at Edwards with his wife, Lillian, and their three children.

E-Z Shorthand Classes to Start Monday

The popular E-Z Speedy shorthand series will be repeated again this year with first class scheduled to start on Monday, September 30, it has been announced.

The sessions are being sponsored by Personnel Activities with arrangement and coordination handled through Education and Training group.

E-Z Speedy shorthand which
 (Continued on Page 2)

To Denmark on Five Gallons

We who are privileged to live in California are often, I am convinced, not as appreciative as we should be of the wonderful and interesting spots near Los Angeles that are ours for the asking. Maybe it is a question of living so close to the forest that we do not see the trees. I was reminded of this when a few weekends ago my family and I drove north on Highway 101 to that charming picturesque village known as Solvang.

Solvang is a Danish community settled some years ago primarily by Danes who migrated

cent hills that General John C. Fremont accomplished his historic march through Gaviota Pass and wrote a most important page in the history of California.

But on to Solvang—no need to go to Denmark across the sea, for here you find similar neat farms, well kept gardens, Danish homes, and, oh, those bakery shops! I dare you to leave without a bag of goodies. And you will meet the friendliest folks this side of Copenhagen. Visit and talk with the natives.

Before returning home, by all means stop by Andersen's in the

By John B. Clark
Norair Director, Industrial Relations

from their native Denmark, bringing with them the traditional trademarks of the Dane—industry, cleanliness and friendliness not surpassed by any European country that I know of.

Visit Solvang for yourself sometime soon. You will be amply repaid and will feel, as I always do, that you are, in truth, transported



to the land of Denmark—and all on five gallons of gas (more or less) if driving from Los Angeles.

To enhance the natural beauty of your trip, I suggest you approach Solvang from the south via the San Marcos Pass, entering the Pass a few miles north of Santa Barbara off (right) route 101. If you go this way you will treat yourself to some of the most wonderful natural scenic beauty which our fabulous state provides.

About half way from Santa Barbara and Solvang, you will pass the old "Cold Spring Inn." Drop in for rest and refreshment if you have time. You will not soon forget it. The Inn is located smack dab in the center of some of the most historic land in California, for it was over the adja-

cent hills that General John C. Fremont accomplished his historic march through Gaviota Pass and wrote a most important page in the history of California. While at Andersen's go downstairs and visit the famous wine cellar where you will be guested with a glass of the famous Danish cherry wine "made in Denmark for Andersen's."

On your return home, you will soon find yourself on the wonderful drive between Santa Barbara and Los Angeles along some stretches of California's most beautiful shoreline. If you have not already made this trip, I urge you to do so. Take the kids. They will love it. And my guess is that you will consider it time well spent.

If you have recently enjoyed a motoring trip in or around Los Angeles visiting some famous landmark, let us hear about it. I will pass it along to our fellow Northrop men and women so that they too may enjoy "happy motoring" with profit.

Dr. J. C. Yao Joins Norair Systems Team

Dr. John C. Yao, noted authority in aerospace dynamics research, has joined Technical's Structures and Auxiliary Systems group, it has been announced by Dr. C. M. Wong, chief.

Dr. Yao received his M.S. degree from the University of Michigan and his Ph.D. from Illinois Institute of Technology. He has had many years of outstanding experience with such companies as Aerospace Corporation, Douglas Aircraft, and Sargent and Lundy.



DR. J. C. YAO

His technical publications include papers on buckling and vibration problems of elastic shells, elasticity, thermostress and dynamic instability. He is a registered structural engineer of Illinois and a member of Sigma Xi.

Dr. Yao will instruct a course at UCLA on "Static and Dynamic Stability of Structures" beginning the latter part of September.

Work Safely Today

"... A safe plant and a clean shop are signs that say a prideful team works here."

Bob Lloyd, Norair vice-president and assistant general manager, Operations

STOP FIRES

Fire Prevention Week

October 6-12

Greater Los Angeles Chapter,

National Safety Council

SAVE LIVES

Hinchliffe Made Director Of Corporate Materiel

Appointment of J. W. Hinchliffe, jr., as Corporate director of Materiel for Northrop Corporation has been announced by Thomas V. Jones, Northrop president and chairman.

Mr. Hinchliffe will be responsible for corporate-wide coordination of materiel management activities and policies. He will report to Robert R. Miller, senior vice-president, Administration.

Mr. Hinchliffe, who has been

with Northrop since 1950, was assigned to the corporate staff in 1962. He previously held assignments in the Norair Division as director of commercial products and director of materiel. Prior to joining Northrop he was director



J. W. HINCHLIFFE

of materiel at Shepherd Tractor and Equipment Co., Los Angeles, for three years and was a materiel director at North American Aviation for eight years.

Mr. Hinchliffe is a graduate of Stanford University. He is vice-chairman of the materiel procurement committee of the Aerospace Industries Association and is a member of the National Association of Purchasing Agents.

Shorthand

(Continued from Page 1)

helped improve dictation and note-taking proficiency of many personnel last year consists of a thorough grounding in the fundamentals of practical shorthand as calculated to meet all types of dictation requirements.

The course is not only useful for clerks, stenographers, and secretaries but serves the needs of those who engage in briefings, staff meetings, idea and planning sessions as well.

No previous shorthand knowledge is needed.

Classes will be held Mondays and Thursdays from 5:15 to 7:15 p.m. at the Plant One cafeteria.

Cost for the 10-week course including textbooks and materials is \$3 a person.

Enrollment is being handled by Personnel Activities. Registration is on a first come, first served basis.

Flu Shots

(Continued from Page 1)

Palmdale, Friday morning. Next week the clinic will move to Edwards for an afternoon, Wednesday, October 2.

Signup cards are being distributed with paychecks and Medical asks that these be filled out completely prior to the clinic. This to save time.

Persons under 21 require approval of parent or guardian.

NORTHROP NORAIR NEWS

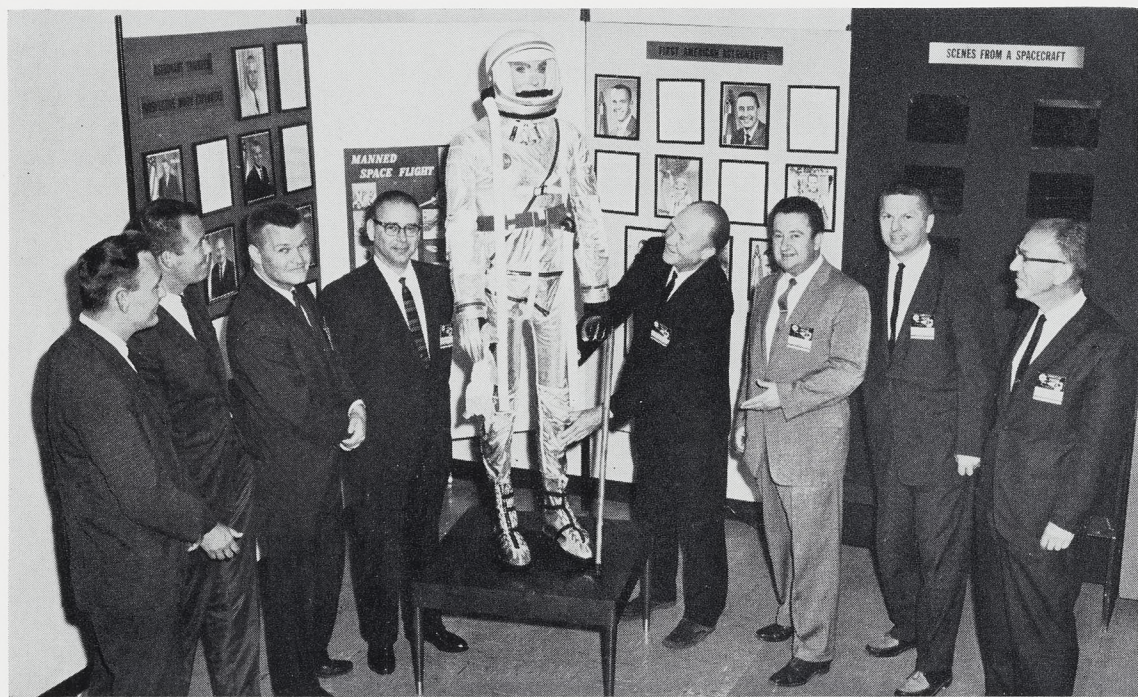
VOL. 21

NO. 17

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A NORTHROP CORPORATION
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NORAIR DIVISION
Published every other Wednesday

CHARLES BRADFORD, Editor

Permission to publish material with credit to Northrop Norair News will be granted. News office extension—2456. Outside lines—OR 8-9111, OS 5-4611.



APOLLO ASTRONAUT—Northrop Space Laboratories personnel recently visited Marshall Space Flight Center at Huntsville to present a two-day lecture before MSFC lunar logistics engineers. The NSL talks were on latest life sciences and biomedical information. MSFC officials indicated that the NSL lectures would henceforth be held annually. NSL participants (left to right) Dr. Richard W. Eppley, Dr. Frederick C. Thiede, Dr. Donald F. Mitchell, Dr. James G. Gaume, the Apollo astronaut, Dr. Charles F. Lombard, Dr. Walter Kuehnegger, David L. Schloredt (all of the Life Sciences section), and Arnold Shlosinger of the Systems Technology group.



PLASTICS—Lois Paris, secretary, Manufacturing Research and Development, has been appointed secretary of the Society of Plastics Industries, Plastics for Tooling Division, Western chapter. The group picked Lois because of her extensive knowledge on the subject gained from constant association with Norair R&D activities plus her personal education program on the outside.

NRC HIKERS AND PACKERS MEN PLANT CLUB FLAG AT MUIR PASS

Hikers and Packers Commissioner Bob Van Allen, and Gordon Madison have placed an NRC pennant at Muir Pass in the High Sierra, Muir Pass being the 36-mile mark on a 56-mile, 9-day hike.

In addition to covering the Piute Pass Trail and Bishop Pass Trail, Bob and Gordon also covered 25 miles of the John Muir Trail through Evolution Valley, Evolution Basin and Le Conte Canyon.

Most of the trip was within the border of Kings Canyon National Park and except for a small portion at the end, was within the High Sierra wilderness area. This meant that there were no roads, vehicles, billboards, neon lights, or other "civilized" improvements to detract from majestic mountains, stately forests, flower-blanketed fields, or

countless bubbling streams.

Both men commented strongly on several points:

Water — on the entire trip, above and below timberline, they were never more than 15 minutes from "the best water in the world."

Backpacking—it's work to carry a 35-pound pack, but it was far less trouble than the people who were using horses, mules or burros. The rounding-up of strays, packing, shoeing, and feeding of stock, was making the trip more work than fun for many of the people they met.

People — age variations were such that they were convinced that this is a sport for everyone. The most popular age bracket seemed to be 10 through 65.

Elevation Changes—as in most mountain areas, there is very lit-

tle flat space and any time you are moving you are going up or down. While small elevation changes (less than 100 feet) were not accounted for, total elevation gain and loss amounted to more than 20,000 feet.

Bob stated that it was as near perfect a trip as one could have desired. The fishing was good (plenty of Goldens), the loafing was enjoyable, the scenery was indescribable, and the weatherman was most cooperative. On the seventh day at 11,300 feet, they encountered a three-hour snowstorm. Asked what they did when the snowstorm hit, they both stated, "We enjoyed it."

Although this was the last major trip of the year, it does not signal the end of activity for the Hikers and Packers. September 28 and 29 will see a 30-mile trip to the deepest gorge in the United States. The gorge in the Kings River area of California, is 3000 feet deeper than the Grand Canyon of Arizona. After October first, the Hikers and Packers will begin a schedule of basic hikes designed to encourage newcomers to join. "It's pretty much like swimming in a cold pool," says Bob, "once you're in, it's not so bad." They will fit their activities to areas where interest is shown, from local one or two milers for people with small children, to Sierra peaks which have never been climbed or lakes which may be fished by less than a dozen people a year.

September 30 through October 11, the Club will have a display in the main cafeteria.

NOW CHEW YOUR VITAMINS—P-A HAS NEW KIND

Personnel Activities has added for sale a new fruit-flavored chewable multi-vitamin of the Dale line, it has been announced by Dick Pryor, general supervisor.

The new vitamin has especial appeal for children or others who have difficulty in swallowing a tablet or capsule.

Dale chewable vitamins are manufactured by the same reliable drug firm that has supplied Dale Therapeutic and Merritt V-M tablets for many years. The new formula is available at the moderate price of \$2 a bottle of 100 multicolored tablets.

Northrop personnel can also save when they purchase Dale's Therapeutic vitamin-mineral tablets for \$4 per 100, or the Merritt V-M formula for only \$2 per 100.

All three products are available through Personnel Activities and Medical Service branches.

MAC McLARNEY SCORES AN ACE

Mac McLarney, longtime Northrop Transportation supervisor, had the magic touch at Singing Hills golf course. He entered golfing's Valhalla with a hole in one on the 164-yard eleventh hole.

And Mac never saw it. He was busy retrieving his tee when the little white ball dropped in.

Witnesses were the Jim Quicks, dad and son, and Jim Slecta.

Mac used a four iron.

He has played golf for 20 years and this is his first ace.

Lost Frontier Next on List for NRC Camp Club

This weekend the NRC Camping Club will crank up their pickups and take off to Marrone's Lost Frontier campground, it is announced by Max Douglas, Norair commissioner.

The Lost Frontier is located approximately halfway between Fawnskin and Highway 18 which is across the lake from Big Bear City.

A four-day affair which will be handy for those on vacation, the trip rates a camping cost of \$3

a unit and Max reports that an additional reduction will be made if more than 20 units sign.

For those who are not on the campfire-cooking-out side breakfast, lunch, and dinner will be served at the lodge. Horses can be rented at the Lost Frontier for \$1 an hour, hay rides are 25 cents and swimming in the pool is pegged at 50 cents for all day.

A potluck dinner will be held on Saturday evening, September 28 at 5:30 p.m. This will be followed by a movie and a bonfire.

Following this outing, next event on the Club agenda will be a planning meeting on Wednesday, October 2, 7:30 p.m. at the Clubhouse.

SKI TUNE UP CALLS FOR TRIP TO MT. WHITNEY

The NRC Ski Club intends to start the 1963-64 season off right, according to George Kern, Norair commissioner.

One of the first items on the Club planning sheet is an Alpine climb and campout at the 11,000 foot level of Mount Whitney, no less. This is designed to tone up those summer tired muscles, not to mention the prospect of a cheese fondue party from the sleeping bag.

This trip will go September 28 and 29. "Barring sudden blizzards," says George.

Meanwhile, regular Ski Club meetings have already started at the Clubhouse. They are being held on the first and third Wednesday of every month.

This year there will be training and instruction sessions, ski movies, and a carefully planned series of Club trips for both day and weekend skiers.

Also in the works is an open package plan trip to Europe for those who feel that they must have a try at the Alps.

FIRST FLIGHT COVERS NEEDED

The NRC Stamp Club has a project.

Needed are first flight covers carried by Northrop aircraft over the years for show at the Southern California Stamp Exhibition.

On a loan basis, of course.

Members of the team who have such covers are asked to contact Personnel Activities, extension 2784.



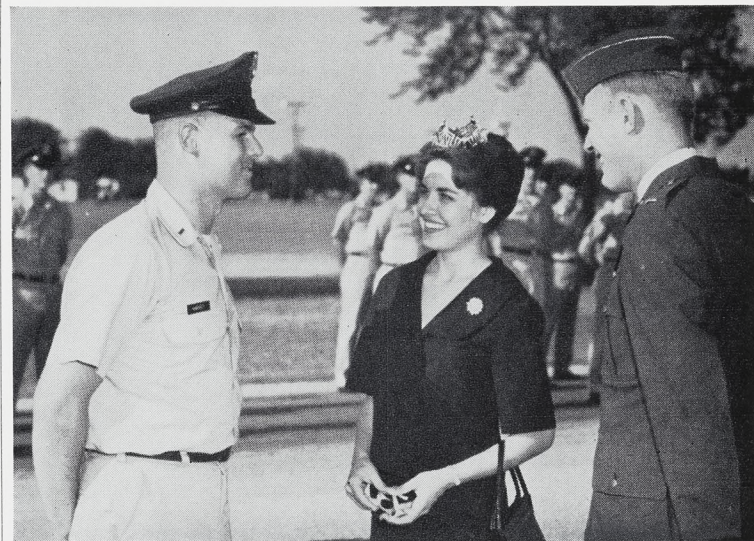
P-A MAN — Tom White, new Personnel Activities sports and events specialist, has worked for Northrop between military duty tours and college since 1941. He recently moved to P-A from Customer Service logistics where he specialized in support deficiencies in airframe spares, AGE, and AGE spares. Tom graduated from the University of California, Santa Barbara with a B.A. in education and has done graduate work at USC. He was Leuzinger student body president. He has been night shift representative for the NRC, softball commissioner, served as sergeant-at-arms and NRC Council rep, special event committee chairman. Tom replaces Don Greco who is now on tour of duty in Personnel.

At Vance

Flight Line Fashions



THE T-38 AND THE LADY—Miss Cheryl Ann Semrad, "Miss Oklahoma of 1963" and newly arrived T-38 trainer present newest in flight line fashions at Vance Air Force Base. Occasion was Miss Oklahoma's recent visit to the base which is near her home town of Waukomis, Oklahoma. Cheryl Ann welcomed the pilots delivering the first three production T-38s to be used in the Vance undergraduate pilot training program.



LUCKY PILOT TRAINEE—Cheryl Ann chats with 2d Lt. Larry E. Harvey, commander of Troops, after a review ceremony. Onlooking is escort 2d Lt. J. F. Niland of the wing information office.



(USAF PHOTOS BY LESLIE TENNANT)

SHINY NOSE—Right for the pretty T-38, but unthinkable for pretty Miss Oklahoma. Cheryl Ann, whose mother is an employee in base maintenance, christened the first Vance T-38, and did very effective job of publicizing arrival of the Mach 1.5 trainer. Photos were furnished the Northrop Norair News by Air Force Information officers at Vance and Randolph.



RIDES WANTED

7 a.m. — 3:45 p.m.

STUDEBAKER & STEARNS, Long Beach, Charles H. Lane, ext. 1729, 430-4274. 2

7:30 a.m. — 4:15 p.m.

PRAIRIE & CENTURY BLVD., Inglewood, Paula M. Duffy, ext. 1787, OR 3-4577. 3

YUKON & ARTESIA BLVD., Torrance, Robert P. Henry, ext. 1555, 329-6206. 3

NORMANDIE & REDONDO BEACH BLVD., Gardena, Helen S. Shaver, ext. 565, 566, 4022, 324-0237. 3

VAN NUYS & FOOTHILL BLVD., Lakeview Terrace, Carl Valladares, ext. 565, EM 9-3019. 3

EDINGER & BOLSA CHICO RD., Huntington Beach, Robert G. Heiss, ext. 1951, 897-7166. 3

8 a.m. — 4:45 p.m.

IMPERIAL HWY. & NORMANDIE, Los Angeles, Lynne Miller, ext. 555, 755-3805. 5

GREVILLE & BUCKTHORNE, Inglewood, Meet rider at La Brea & Buckthorne or Greville & Arbor Vitae, Minnie C. Lauer, ext. 2191, OR 4-1847. 5

YORBA LINDA AVE. & IMPERIAL HWY., Yorba Linda, Willing to drive to Brea, Fullerton or any nearby town, Cathy Campanella, ext. 1547, 528-4459. 5

VENTURA & HAZELTINE, Sherman Oaks, Carl N. Brooks, ext. 2701, 789-1698. 5

FIGUEROA & CARSON, Torrance, C. H. Vance, ext. 2313, 835-1031. 5

ORANGE AVE. & DEL AMO ST., Long Beach, W. H. Covert, ext. 1919, GA 3-1242. 5

RIDE OFFERED

7:30 a.m. — 4:15 p.m.

VAN NUYS & FOOTHILL BLVD., Lakeview Terrace, Carl Valladares, ext. 565, EM 9-3019. 13

EDINGER & BOLSA CHICO RD., Huntington Beach, Robert G. Heiss, ext. 1951, 897-7166. 13

8 a.m. — 4:45 p.m.

FIGUEROA & CARSON, Torrance, C. H. Vance, ext. 2313, 835-1031. 15

ORANGE AVE. & DEL AMO ST., Long Beach, W. H. Covert, ext. 1919, GA 3-1343. 15

POMONA-W. COVINA via San Bernardino Fwy. Duane Heise, ext. 2411, 354-2695. 15

BBSF Classified Ads

BBSF classified ad service is provided free of charge to all Northrop Norair personnel.

Ads for agencies, commercial enterprises and private businesses are not accepted.

Deadline is noon Wednesday, one week before publication.

FOR SALE

TRIMMER & edger, hand mower Pennsylvania, \$12.50; lawnmower, reel tora, \$25; air conditioner, Frigidaire, \$40. 757-6960. A

STEREO-TV comb., 1962 RCA Victor, \$300; chrome reverse wheels, 4, 14" for Chevrolet, \$65. 378-5924. A

MONZA Spyder, 1963 4-spd., \$2195. 765-2904. A

OLDS, 1956, p/brakes, p/steering, \$300. Box 1701. A

PLYMOUTH, 1954, \$125; Chevrolet, 1954, \$200. 674-1672. A

MOVIE LIGHTS, 4 light-bar, w/3 lamps, \$5; Health-O-Meter, stork scale, 30-lb. cap., \$5. 376-3849. A

TEATABLE w/stools, \$300; chests, 12 1/2 x 25, \$150; 15 x 32, \$250; 20 x 42, \$495, all antique Chinese hand-carved. Box 1702. A

STOVE, Gaffers & Sattler, w/chrome top center, & griddle, \$35; washer, Kenmore automatic, \$25 or both for \$50; TR-3, 1959, r/h, \$1195. FR 5-7168. A

MERCURY club coupe, 1951, r/h, Mercomatic, \$100; washer, auto., Maytag, \$25; vacuum cleaner, 1963 Kirby, access. incl., \$200. 329-9484. A

MGA, 1960 conv., r/h, \$1350. OS 6-8768. A

COIN BOOKS, Meahria green, set of 12, \$10. Box 1703. A

MOVIE PROJECTOR, 16-mm sound, \$90; Harley Davidson 45, 1949, \$50; engine & trans., 1958 Triumph T-10, \$75; also rear end & 2 tires, \$25; divina reed. & tank, Health Ways, \$40. DA 5-2871. A

CORVETTE, 1957, 340-h.p., 3-spd., \$1595. 675-2384. A

KNITTING MACHINE, German-made, many access., \$100. 379-2765. A

BURCHCRAFT, 18', Mercury 400 outboard, trailer, \$995. DA 7-0304. A

FALCON, 1963 convt. 4-spd. trans., \$2050. 323-1374. A

FOR SALE

SPALDING, super flame thrower, dual ignition, completely o/hauled, \$75. 397-5045. A

JEEP, 1948, freewheeling hubs, tow bar, \$675. DA 3-1509. A

MATTRESS & box springs, full-size, \$25. 323-9858. A

BOAT, 14', 25-h.p. Evinrude, trailer, \$300. PL 8-5220. A

CITROEN ID-19, 1959, \$650. GE 1-4233. A

REFRIGERATOR, Servel, w/freezer, \$85; freezer, Marquette, 450-lb. cap., \$115; 270 Winchester, \$80; Winchester pump, 12-ga., \$50; recurve bow, Gorden Night, 54", \$33. PL 4-5288. A

VW, 1961, radio, \$1450. 933-1964. A

FALCON, 1960, 4-dr. sed., r/h, auto trans., \$850; Comet, 1962, r/h, auto trans., \$1850; camera, Retina 1A, w/syn. flash, \$45. OR 0-4424. A

STEREO amplifying system, 20 watts/channel, \$75; speakers, 2 Wharfedale w/70 3-way, \$270; ribbon mics., 2 Dynaco B&O, \$100; stereo recorder, Ampex 1260, \$400; projector, Keystone K1095 8-mm. \$90; preamp, McIntosh C20, \$150. FR 7-1043. A

AIR COMPRESSOR, 1/2-hp, R.I. motor, for hobby & light production spraying & silk screen use, \$70 or make offer. 753-5704. A

CHEVROLET, 1954, 2-dr stick, rebuilt eng., r/h. \$250. NE 9-2097. A

PONTIAC Bonneville, 1961, h/top, r/h. \$2595. EM 9-2474. A

DINING TABLE & 4 chairs, \$15. DA 9-5879. A

REFRIGERATOR, Hotpoint; range, O'Keefe & Merritt, both 7-yr-old, both for \$75. DA 9-6459. A

TERRIERS, toy fox, 6-wks-old, male & female, \$35 ea. DA 9-2105. A

PONTIAC Chieftain, 1957, 2-dr. sedan, \$250. FR 9-4517 after 6 p.m. A

TROPICAL FISH aquariums, complete, one 5, 6 & 20 gal. tanks, \$50. TO 1-6174 1 & 4 pm Saturdays. A

CHEVROLET, 1954 4-dr., major motor & brake o/haul, \$295. OR 7-0732. A

TIRES & tubes, 4 670x15, black wall, \$45. 327-0159. A

DRUM SET, Slingerland, \$175. OR 7-6348. A

CORVAIR, 1960, auto. trans., r/h, \$995 FR 9-6824 after 6 p.m. A

STOVE, Wedgewood, 2 broilers, center griddle, \$55. FR 2-1945. A

CRIB & mattress, \$20 or best offer; dishwasher, 1957 G.E. Mobilmaid, \$40. FA 1-1655. A

CORVAIR Monza, 1963, 4-spd. trans., \$2000 or best offer. FR 6-9651 after 5:30 p.m. A

RANGE, Gibson elec., 4-burner, \$50. FR 7-2294 after 6 p.m. A

TEETER-TOTTER, custom-made, \$7. PL 6-0015. A

DRILL, portable 2.5-h.p. Clinton eng. powerhead, 6" auger, \$95. WE 3-4551. A

SHOE SKATES, roller, outdoor, ball bearing wheels, boy's, size 4, \$5. 371-9651. A

OUTSIDE DOORS, 2, 32" wide x 67" high, \$2; w/glass \$5. OS 6-0041. A

VOLKSWAGEN, 1955, w/1960 eng. trans., \$700 or best offer. 430-1492. A

STOVE, Kenmore aas, 36", copper finish, \$50; wardrobe cabinet, 60", wood, \$10. 831-3121. A

REFRIGERATOR, Coldspot, \$40; aas range, Norae, \$25. FR 1-2705. A

KITTENS, Siamese, 9-wks-old, \$10 ea. 371-2347. A

HOUSE, 3-bdrm., carpetina, drapes, disposal, patio, landscaped, Torrance, \$19,750. FR 8-5810. A

TWIN BEDS, box spring & mattress; vanity dresser, \$100 for all. AX 1-4304. A

BICYCLE, boy's 26" 3-spd, \$15. PL 5-4497. A

BOAT, 15', sport fisherman, Johnson, 30-h.p., trailer, \$385 or best offer. 371-9730. A

SNOW TIRES for VW, 2, 560x15, \$30. OS 9-4778. A

WARDROBE CLOSET w/sliding doors, 4' x 6' Philippine mahogany, \$20. ME 0-5562. A

PUPS, toy dachshund, 6-wks-old, \$25 ea. YO 4-5105. A

HIDE-A-BED, Simmons, \$35. OR 1-4720 after 5 p.m. A

SAILBOAT, 15 1/2' Omega class, trailer, \$650. FR 8-6712. A

CHEST OF DRAWERS, 18" deep, 51" high, 34" wide, \$15; spring horse, Cal's Colt, \$5. PL 5-7521. A

CAMPING TRAILER, teardrop, 11', \$75. FA 8-3306. A

GIUITAR, Hawaiian, elec. w/amplifier, \$75. OS 6-1085. A

CADILLAC, 1961, air cond., full power, \$3500. 378-6521. A

BUICK, Riviera Roadmaster, 1955, full power, new brakes & drums, \$395. FA 1-0020. A

**Buy
Savings
Bonds**

FOR SALE

DODGE, 1956 2-dr., r/h, good tires, \$250. 374-7844. A

TABLE, mahogany tilttop, \$20; TV, maple, console-type, Packard Bell, \$35; drum table, mahogany, w/leather top, \$20. FR 7-1218. A

DODGE station wagon, 1960, take over payments of \$63.69 plus \$20 for transfer charges, \$1642 incl. finance charges. 897-2632. A

GAS RANGE, O'Keefe & Merritt, deluxe model, \$50. PL 8-9825. A

WEDDING DRESS, hoop & veil, size 16, \$50 or dress, \$40; hoop, \$5; veil, \$5. 576-2615. A

DAVENPORT, provincial, \$50; stove, O'Keefe & Merritt, chrome griddle, \$50. 325-3865. A

ACCORDION, Univerasl, 120-bass, 3 switches, w/carrying case, \$75 or best offer; watch, Bulova, girl's, 2 diamond chips, \$40. 674-1847. A

OSCILLOSCOPE, Hickok, 5", new tube, \$45. FR 4-0021. A

CORVETTE, 1954, 6-cyl. Powerglide, eng. rebuilt, 2 tops, \$950 or offer. FR 5-7038. A

LUGGAGE RACK, 43"x67"x8" deep, \$10; tent, 9'x11', \$10; 2 camp cots, \$3.50 ea. PL 5-9345. A

MOTORCYCLE, 1962 Honda, 150cc, \$365. 770-3458. A

TRAILER, 2-wheel, 4x8 w/Universal hitch, \$75. 834-9137. A

HUDSON Terraplane coupe, 1937, \$35. OR 2-8629. A

VOLKSWAGEN, 1961, r/h, w/w, \$1400 or best offer. DA 7-8994 or DA 9-9464. A

FORD Ranchero, 1957, 312" stick, 3-2 bbls, \$975 or offer; runabout, 16' Fleetcraft, 40-hp Mercury, \$575 or offer. 323-3692 or 329-9656. A

RUGS, wool, beige, 1-yr-old, w/pad, 12x18, \$100; 9x12, \$50; range, Wedgewood, gas, 40". \$20. 396-1100. A

FORD, 1954, 4-dr. sedan, \$135. OR 1-8672. A

RIFLE, .270 FN Mauser w/4X Bushnell scope & adj. tripper, 25 rounds of ammo, \$150; pistol, S&W K22 w/target tripper & grips, \$50. EX 4-2077 after 7 p.m. A

SECTIONAL, 2-pc., dark grey, \$35. 575-0579. A

BICYCLE, 24" boy's, \$10; 26", girl's, 3-spd., \$12. FR 5-0747. A

TV, 58 model, 21" blonde, \$15; chaise lounge, 2 w/pads, \$8. OS 9-2337. A

PIGEON HOUSE, \$10. TE 3-2512. A

HOUSE, 2-bdrm., Manhattan Beach, 80% loan may be assumed, 2nd trust deed as part of down payment, \$19,250. FR 2-6628. A

OLDS 88 Holiday, 1956, 4-dr. sedan, power, 2 new tires, \$350. EX 3-9172. A

IRONER, Manale, \$40; baby carriage, \$10. OR 1-0357. A

OLDS 88, 1958, 2-dr. h/top, pwr. steering & brakes, \$995. HA 1-4869. A

LOT 213, San Moritz Club tract 3108, Lake Gregory, \$2400. DA 4-4845. A

CHEVROLET Impala, 1961, 2-dr. h/top, Powerglide, \$2200. 354-2695. A

CHEVROLET Impala, 1963, auto., 4-dr., r/h, power steering, \$2925. 677-3113. A

MATTRESS & box spring set, dble.-size, \$25. 377-4489. A

HOUSE, 6-room, fireplace, fruit trees, garden, Torrance area, \$15,500. DA 4-3612. A

VW CAMPER, 1962, sleeps 4, \$1795. FR 9-3003. A

MERCEDES BENZ, 190SL, 1961, new tires, AM-FM radio, heater, \$3950; Ford, 1957, r/h, full power, \$850. FR 7-1122 after 6 p.m. A

PIANO, Story & Clark, spinet, \$675. FR 5-7990. A

WANTED TO BUY

LEATHERCRAFT TOOLS & accessories, 679-5365 evenings. B

BICYCLES, 2 20" boy's, balloon tires, any condition, reasonable. DA 6-0895. B

FORD sedan, 1957 to 1961, 6-cyl. h/top, auto. & p/steering. 657-2968. B

FOR TRADE

EQUITY in 1963 Ford Fairlane for 1956-57 Chevrolet V-8, h/top. 375-7346. C

FREE (to be given away)

SIDEWALK CEMENT, chunks, used for rustic fencing or walls. PL 4-8142. D

PARAKEET, 7-mos-old, w/caae, 434-8641. A

PUPS, cocker-spaniel & dalmation, 6-wks-old, male & female, OS 5-8278. D

RENTALS OFFERED

APTS., 1-bdrm., new, ultra-modern, pool, patio, Lawndale, from \$120. 326-0474. E

HOUSE, 2-bdrm., 2 car garage, cinder block fencing, patio/barbecue, \$135 mo. OS 6-3900 days. 371-8711 evenings. E

APT., 2-bdrm., built-ins, w/w carpets & drapes, enc. garage, walking distance to Northrop, \$120 mo. 679-4867 after 6 p.m. E

CABIN, Big Bear Lake, 2-bdrm., sleeps 9, fireplace, walk to village, 10% discount to Northrop employees, \$65 wk. or \$12.50 a day. DA 6-1173. E

APT., 2-bdrm., carpets, drapes, built-ins, garage, \$96.50. OS 6-2501. E

APT., 2-bdrm., unfurn., garage, fenced yard, close to Northrop, adults only, \$87.50 mo. OR 7-2448 after 5 p.m. or weekends. E

Scouting Honor



EXPLORER POST CHARTERS—Centinela District Boy Scout Executive John D. Warnick, fourth left, presents Norair with official charters for two company-sponsored "special interest" explorer posts. Accepting for the Division on his left and right are Welko Gasich, vice-president and assistant general manager-Technical, and Bob Lloyd, vice-president and assistant general manager-Operations. At left are Tom McCarthy, manager, Administration and chairman, Centinela District, BSA; and Charley Eyres, assistant to the vice-president and assistant general manager-Technical and committee chairman, Aerospace Post 173. At far right is Bob Bagby, chief, Manufacturing Program and Norair BSA post advisor.

Company Worldwide—Gasich Tells Rotarians

The far-flung, diversified activities of Northrop Corporation—ranging from radio communications in troubled South Viet Nam to recovery systems for the Mercury astronauts to jet trainers for the U.S. Air Force—were described to the Vernon Rotary Club.

Speaker at the club's regular meeting at La Villa Basque was Welko Gasich, vice-president and assistant general manager, Technical, Norair Division.

Mr. Gasich described the Company's diversification from three major defense programs in 1955 to more than 70 programs and products today. He traced its growth from a single location in Hawthorne to a worldwide complex of factories, laboratories and offices employing some 19,000 people and rolling up a sales total of nearly \$350 million a year.

In addition to headquarters in Beverly Hills, Northrop now has facilities in Hawthorne, Anaheim,

Palos Verdes, Newbury Park, Palmdale, City of Industry and Edwards Air Force Base, California; El Paso, Texas; Norwood and Needham Heights, Massachusetts; Washington, D. C.; and Huntsville, Alabama; in addition to district offices throughout the U.S., Europe, Asia and the Pacific islands.

Northrop's diversified products, Gasich told the Rotarians, include the revolutionary X-21 Laminar Flow Control aircraft, U.S. Air Force T-38 Talon supersonic jet trainers, F-5 Military Assistance Program jet fighters for allied nations, portions of the Boeing 707 jet liner and KC-135 aerial tanker, missile inertial guidance systems, space navigation systems, portions of the Ranger moon probe, supersonic target drones, battlefield surveillance drones, recovery systems for Projects Mercury, Gemini and Apollo; automatic checkout systems for Polaris and other missiles, worldwide radio and television communication systems, undersea communications cables, electronic voice warning systems that automatically sense malfunctions and warn of trouble in bombers, transports and missile silos; submarine periscopes, architectural aluminum products, and many others.

FRANK LYONS IS HONORED BY COAST GUARD

Norair's Frank Lyons, chief, Electronic Systems group, has been selected "Auxiliarist of the Year" in honor of his record of service to the Eleventh Coast Guard District Auxiliary.

The award is presented annually by the International Sports, Vacation and Travel show.

Mr. Lyons is currently commander, Flotilla 65. Other distinguished positions he has held are Division Command officer; Division Operations officer and Flotilla vice-commander.

RENTALS OFFERED

APT., 3-bdrm., 1 1/2 bath, w/w carpet, drapes, garage & patio, children ok, \$160-165. OS 5-7938. E

CABIN, Lake Arrowhead, 1/2 mile to lake & village, \$45 wk. 375-2504. E

HOUSE, 2-bdrm., unfurn., garage, \$100; apt., 1-bdrm., unfurn., \$75; furn, \$90; bachelor, furn., utilities pd., \$80. OS 5-9695. E

HOUSE, 2-bdrm., garage, in Manhattan Beach, unfurn., \$125. FR 9-1357. E

HOUSE, 2-bdrm., garage, 1 block from El Segundo & Prairie, \$90. mo. DA 3-5497. E

RENTALS WANTED

HOUSE, unfurn., 2-bdrm., dble. garage, need by October 1. DA

NORTHROP NORAIR NEWS

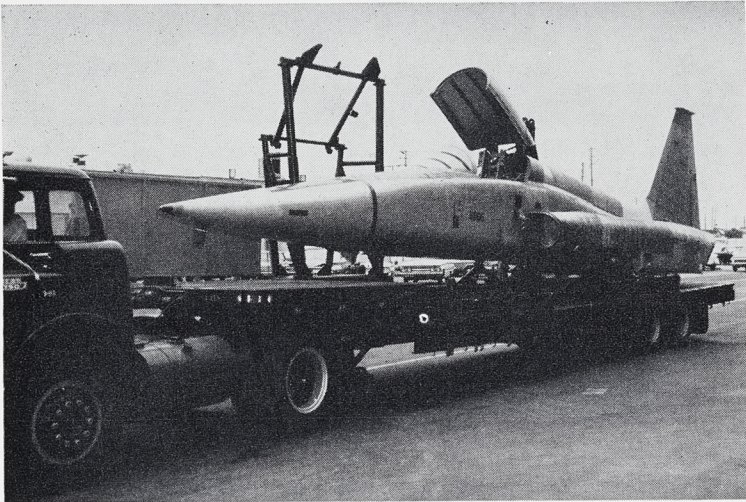
Issued biweekly by Norair Division of Northrop Corporation

• Wednesday, October 9, 1963

HAWTHORNE, EDWARDS AFB, PALMDALE

SAN ANTONIO, EL PASO

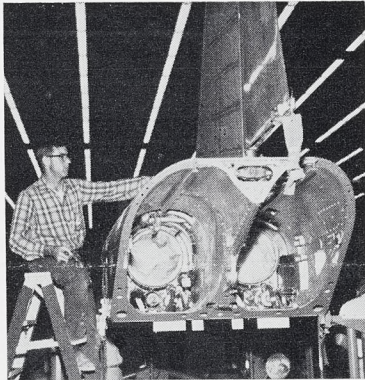
PALMDALE GETS ITS FIRST F-5



F-5 MILESTONE—Palmdale gets its first production F-5, photo showing the airplane loaded aboard Norair truck for over-the-road delivery. Event took place last week, on schedule, and with the fighter 100 per cent assembly line complete. See story for program status and details.



SIGNING IN — Palmdale's Lefe Hamill, supervisor, Quality Control, and Bill Wible, foreman, Palmdale final assembly, review "paper" on the first production airplane to arrive at the facility. AOC played important part in eliminating manufacturing shortages.



IN WORK — No time was lost processing the F-5 which will lead the parade of production fighters down the Palmdale line to flight door. Here Ed Farmer and Quince White (back to camera), final assembly mechanics, remove transport wrappings.



TOM McCracken—Mr. McCracken, Palmdale base administrator, center, briefs facility supervision on the F-5 program after arrival of the fighter from Hawthorne. From left, Norm Hearne, general supervisor, Quality Control; Guy Patt, chief, Manufacturing Services and Support; Wally Johnson, general foreman, Manufacturing Operations; Mr. McCracken, Larry Wisken, lead liaison engineer; John Januleski, production acceptance pilot. Stated Mr. McCracken, "The airplane was perfect . . . 100 per cent assembly line complete. A record to be proud of."

DEI—Air Force Development Engineering Inspection team goes over F-5 with great care during visit to Norair. Airplane passed this important milestone with flying colors, only alterations requested being minimal in nature. Fighter is in one of its many armament configurations.

NOLAN PRAISES TEAM FOR FIGHTER ACHIEVEMENT

The F-5 MAP fighter continues to pass military and Company milestones and with several outstanding accomplishments already chalked up to her supersonic credit.

The first production F-5 to arrive at Palmdale immediately rang up a performance mark that quite likely will surpass anything the industry has achieved to date—that of being 100 per cent assembly complete as it left the Hawthorne (home plant) line.

Northrop Earnings Equal Last Year, Jones Reports

Northrop Corporation's consolidated net earnings for the fiscal year ended July 28, 1963, were \$9,056,421, slightly more than the previous year's earnings of \$9,051,323, according to Thomas V. Jones, president and chairman. These earnings were equivalent to \$2.16 a share on 4,201,063 shares outstanding at July 28, 1963, as compared to \$2.16 a share on the 4,185,156 shares outstanding a year earlier.

Consolidated sales for the fiscal year totaled \$346,960,908, within \$500,000 of last year's sales of \$347,460,547.

The Company's backlog at July 28, 1963, amounted to \$392,514,000. This compares with a back-

log of \$325,000,000 on April 28, 1963.

"The year's results have to be viewed in the light of the Skybolt cancellation early in January," Mr. Jones stated. "Our work on the Skybolt guidance system amounted to 25 per cent of our total volume. The Company's diversification of technologies and

(Continued on Page 2)

Williams T-38 Sets High Mark in Test

A Northrop T-38 Talon supersonic jet trainer recently recorded a utilization of more than 100 hours in one month at Williams Air Force Base, Arizona, during a three-month maintenance and utilization test program with a force of 12 T-38s, USAF Air Training Command records show.

The entire T-38 force registered an average utilization of 62.7 hours for each aircraft, with every T-38 in the program exceeding 50 hours a month during the entire period. The test was carried out after the aircraft had been in service at Williams only nine months.

At the same time, the T-38 test force established a maintenance index of 13.4 maintenance

(Continued on Page 2)

First member of Northrop management to comment was Tom McCracken, Palmdale base administrator. "This is truly a significant achievement," he said. "First airplanes out of assembly are usually delayed by shortages, parts and assemblies that did not arrive in time for instal-

F-5 STATUS

... Technical says fighter rates customer A-OK.

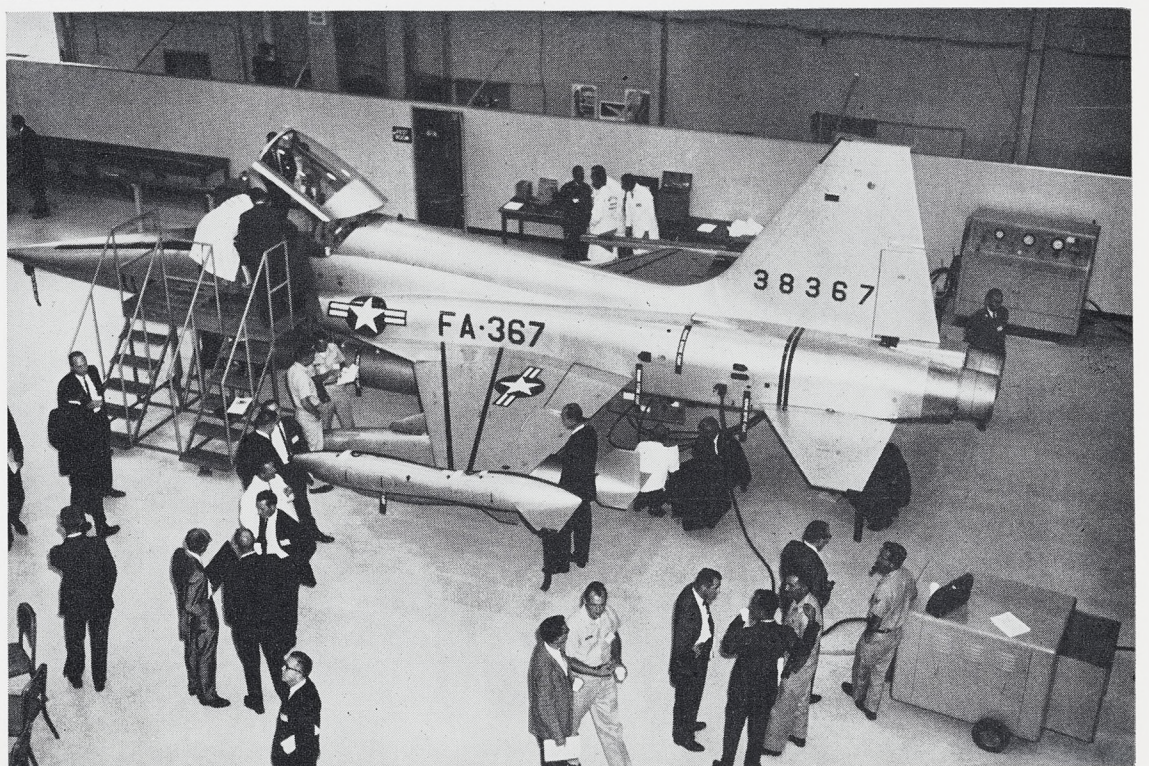
... Global support plans in high gear.

... Program on schedule.

lation. But this F-5 airplane was perfect. It is the end result of a good plan well managed by the people at Hawthorne, both in Technical and Operations."

Mr. McCracken also praised the procedure whereby key men at Palmdale such as John Vilarino and Charley Smith were brought to the main plant to work on the line for flight information input during manufacture. "This proved to be a big help to the product," he said. "Problems they were sensitive to—easy if caught in the assembly stage, but major stumbling blocks in production flight operations—were cured right on the factory floor. In all my experience I have never seen anything to match it. The completeness of the

(Continued on Page 3)



MORE M-P-G IN LFC TESTS

Flight duration of a Northrop X-21 has been stretched one and one-half hours by reducing friction drag through Laminar Flow Control.

Jack Wells, chief engineering test pilot for the Norair Division, made his report on the partially-completed X-21 flight program at the seventh annual meeting of the Society of Experimental Test Pilots at the Beverly Hilton.

When flight testing of the first X-21 began last April, Mr. Wells had enough fuel for two hours and 25 minutes aloft. Later, with the X-21 achieving Laminar Flow Control drag reduction over about 65 per cent of its wing span, Wells and other test pilots were able to prolong test flights to approximately four hours using the same amount of fuel.

Laminar Flow Control, under development at Northrop for 14 years, enables large aircraft to save fuel by virtually eliminating friction drag from their wings.

For future aircraft, this will

mean increases of 50 per cent or more in range, payload or flight duration without increasing fuel.

This is how Laminar Flow Control works:

1. Air passing over a conventional wing creates turbulence within the thin "boundary layer" next to the wing skin. This causes friction drag, which in turn creates an unnecessary burden for the aircraft's engines to overcome.

2. If a very small portion of air is removed from the wing boundary layer, the air particles travel smoothly in parallel (laminar) layers, preventing the build-up of high-drag turbulence.

3. This thin film of air is removed from the wings of X-21s by sucking it through many paper-thin slots that run from fuselage to wing tip. Inside the wing skin, the air is diverted through pin-size holes into ducts that conduct it to small turbopumps. The turbopumps exert suction throughout the system and also expel the air overboard.

"The knowledge gained on the X-21 to date is directly applicable to a production wing," Wells declared. "As for the future, it can be stated that the next long-range aircraft can be designed with Laminar Flow Control as a part of the aircraft system."

Earnings

(Continued from Page 1)

tight management controls enabled us to shift gears fast enough to maintain the same level of sales and earnings.

"To take up the slack we moved forward in four main areas—advanced aircraft, electronics, communications and space—while finding new applications for our astro-inertial guidance capabilities. Continuing programs in these areas constitute the bulk of our business for the new fiscal year.

"In addition, we look for growth in the application of our aircraft systems to a broad spectrum of military missions including limited or local warfare, naval uses, long-endurance and logistics aircraft, as well as to supersonic transport needs. We expect there will be new requirements for our electronics and guidance techniques and for control and communications systems. We are also looking toward expansion of our export sales," Mr. Jones said.

Williams T-38

(Continued from Page 1)

man-hours per flying hour. This maintenance index and the outstanding utilization rate of 62.7 hours both compared favorably to USAF expectations of 55 hours a month utilization and a maintenance index of 14.6 maintenance hours per flying hour.

More than 300 T-38s are now in service at Air Training Command bases. Since the beginning of the T-38 program, more than 600 have been ordered from Northrop, where they are being built at the rate of 12 a month.



AN EARLY EARLY BIRD—Ed Bates, executive advisor to Bob Catlin, manager, Norair Quality Control, receives congratulations from his boss upon being awarded special plaque from the Early Birds, an organization of pioneer aviators, all members who flew solo before December 17, 1916. When did Mr. Bates solo? July 17, 1912! He later served as pilot under General Billy Mitchell in World War I. He has been at Northrop since 1951. Mr. Catlin is asking, "How would you like to check out in the T-38, Ed?" Ed's answer, "Fine. Let's take off!"

NRC Scouts Invite All To See Order of Arrow

Highlight of the year is coming up October 11, 12, and 13 for the NRC Scout Troop 262, Commissioner Bill Wareing, when the Order of Arrow Call-out, Boy Scout honor event, Centinela district will be held in Centinela Park.

Activities will begin Friday night and continue through Sunday noon, states Commissioner Wareing.

Contact point for boys who wish to join 262 is at Personnel Activities.

The troop invites one and all to visit their area during the Arrow and see scouting in action. Scouts from all over Centinela Valley will be camped out during this time and will stage impressive Indian ceremonies.

Headline event will be a huge but silent campfire circle of boys at 7:30 p.m., Saturday evening.

Boy Scout Troop 262 holds its regular meetings at the Ra-

mona School, 136 Ramona Avenue, Hawthorne, every Thursday evening.

Stan Thorne is scoutmaster.

BUY YOUR DOORS AT A DISCOUNT

Norair Personnel Activities, Dick Pryor, general supervisor, announces that arrangements have been made with Northrop Architectural Systems whereby Division employees can purchase Arcadia doors and other building front trim at a substantial discount.

A typical Arcadia door is presently on display at Personnel Activities to enable do-it-yourself home builders to see the product firsthand.

A company catalog is also available for study.

Purchase of the doors is being handled through Mr. Pryor's office.

Mr. Nolan Presents 20-Year Pins



TWENTY-YEAR PINS FOR AUGUST AND SEPTEMBER—Nineteen Norair folk meet with Corporate Vice-president and Division General Manager Dick Nolan to receive their 20-year service pins. They are from left, seated, Bill Myerson, Harriet Carroll, Angela Goyen, Mr. Nolan, Betty Lou McClellan, Irene Metro, and Bobby Ray. From left, standing, Harley Vanderlip, Alexander Rosin, Robert Morris, John States, jr., Alfred Aguiar, Frank Bingham, Gaston Kibodeaux, John Mohart, Delbert Jones, William Horowitz, Edward Truett, jr., Merle Lawton, and Steven Baldwin. Big news of the day when this group first came to work at Northrop was Black Widow production, but public would never have known. Entire plant was under strict security, even camouflaged with miles of wire netting and painted feathers made to look like farms and country lanes.

Be a Label Reader, Be Safe, Caution Norair Safety Men

Be a label reader and be safe, cautions Norair's Fire Prevention and Safety group.

This is a timely Fire Preven-

DR. FALLIS TO HEAD NORAIR'S "HYLIET" WORK

Dr. W. B. Fallis, widely known aerospace authority in the United States and Canada, has been appointed to head development activities in Norair's new organization, HYLIET (Hypersonic and Lifting Entry project), it has



been announced by K. E. Van Every, acting manager, Research and Development department.

Dr. Fallis comes to Norair direct from the University of Waterloo, Ontario, Canada, where he was professor of Mechanical Engineering, and chairman of the Department of Mechanical Engineering.

He was educated at the University of Toronto, Institute of Aerophysics, where he achieved bachelor, master, and doctorate degrees in aeronautical engineering.

Prior to his academic position at the University of Waterloo, Dr. Fallis was associated with the Defense Systems Division of General Motors Corporation as chief of the Aerothermodynamics section, Aerospace Operations, where he did work on aerothermodynamic aspects of systems analysis, and had project management responsibility for a naval ship-to-shore weapon system.

tion Week reminder that should become a year around slogan.

Every year, according to National Fire Protection Association records, there are thousands of serious accidents and fires caused by failure of the user to observe warnings printed on containers of flammable lacquers, finishes, paint removers, mastics, solvents, cleaners and similar products.

Before using materials of this kind, read that label thoroughly, say Safety folk. If the product contains a flammable solvent, the label will carry a warning. Your safety depends on how well you heed that warning.

Know these labels and the hazards they guard:

Non-combustible or Non-flammable—These signs mark the least dangerous materials.

Caution! Combustible—Be alert! Do not take liberties with contents so marked.

Danger! Extremely Flammable! or Warning—Flammable! or Caution—Inflammable Mixture!—Take due care. This last category gives off vapors which need only a touch of flame or spark to turn surroundings into a flash of fire.

Whenever working with materials of any kind labelled "flammable" or "combustible" follow these rules and be fire safe.

1. Work in a well ventilated area.
2. Be sure there are no arcing or flame producing devices in the area.
3. Don't smoke.
4. Be sure that all containers are properly grounded.
5. Always use approved safety containers.

NORTHROP NORAIR NEWS

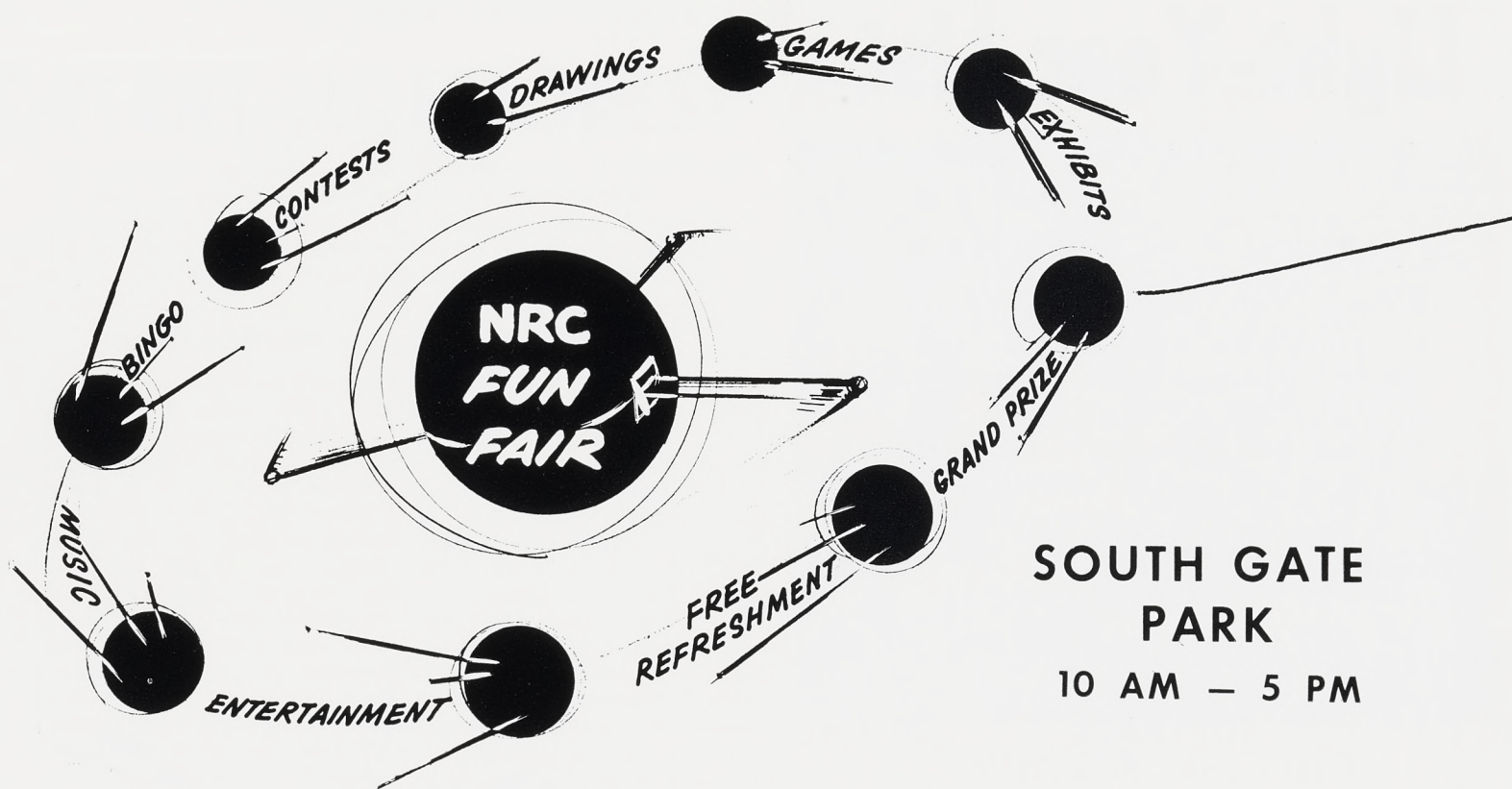
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CHARLES BRADFORD, Editor

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**OCT.
13
1963**



**SOUTH GATE
PARK
10 AM — 5 PM**

Games Entertainment Music

Free Refreshments Contests

Prizes Drawings

Grand Prize

Trip to Stars (Las Vegas for two)

ALL PERSONNEL, FAMILIES, AND FRIENDS OF THE NORTHROP GALAXY* ARE CORDIALLY INVITED TO ATTEND THE NRC FUN FAIR, SUNDAY, OCTOBER 13 AT SOUTH GATE PARK AND TAKE A PLEASURE SPACE CRUISE THROUGH NORAIR-NORTRONICS ES&E RECREATION UNIVERSE.

YOU WILL ORBIT THROUGH 20 OR MORE SATELLITE BOOTHS SEEING EXHIBITS OF THE MANY ACTIVITIES AVAILABLE TO YOU THROUGH THE NORTHROP RECREATION CLUB. BE SURE TO REGISTER AT EVERY SATELLITE BECAUSE EACH WILL HAVE A DRAWING FOR A SPECTACULAR PRIZE WHICH SOME LUCKY ASTRONAUT WILL WIN.

DURING YOUR CRUISE YOU MAY PARTICIPATE IN THE LAUNCHING AND SUCCESSFUL ORBIT OF SPECIAL EVENTS, JOIN IN SOME INTERPLANETARY GAMES AND CONTESTS, OR JUST RELAX AND BE ENTERTAINED BY THE MANY AND VARIED TALENTS OF THE SATELLITE INHABITANTS.

FREE REFRESHMENTS WILL BE ON HAND

FOR ALL PASSENGERS. YOU MAY ORDER A SPECIAL SPACE KIT, CATERED FROM A SATELLITE DINER, WHICH WILL INCLUDE ONE-HALF FRIED CHICKEN, BARBECUED BEANS, COLE SLAW, ROLL AND BUTTER FOR ONLY \$1 A PASSENGER.

THERE WILL BE A GRAND PRIZE DRAWING NEAR THE END OF THE CRUISE, A TRIP FOR TWO TO THE LAS VEGAS STARS, AN ALL-EXPENSE PAID WEEKEND COURTESY OF KIM TOURS. ALL YOU HAVE TO DO TO WIN IS TO REGISTER AT "ORBIT CONTROL" AS YOU BEGIN YOUR SPACE CRUISE. YOUR PRESENCE AT THE DRAWING IS NOT REQUIRED.

THE LAST DAY TO ORDER YOUR SPACE KIT IS FRIDAY, OCTOBER 11. VALIDATED TICKETS TO BE PRESENTED AT THE SATELLITE DINER ARE AVAILABLE AT PERSONNEL ACTIVITIES FOR \$1 FOR EACH SPACE KIT DESIRED. NORAIR AND NSL PERSONNEL CALL EXT. 2784; NORTRONICS, EXT. 2228 FOR FURTHER INFORMATION.

*Corporation.

Light-Year List

Here is your itinerary for a light-year of fun and entertainment.

SUNDAY, OCTOBER 13

Blast off to South Gate Park. Upon arrival, register at orbit control headquarters for the grand prize countdown, then choose your space trail, with stopovers whenever you desire.

LAUNCH SPACE TRAIL ORBIT

10 a.m. Music by the Pendletons All Day

10 a.m. **SOFTBALL** 1:30 p.m.
First Game: Regulation
Second Game: Slo Pitch
Norair-Nortronics ES&E

10 a.m. **GOLF** 1:30 p.m.
Women's Flight
Men's Flight
Putting Contest

10:30 a.m. **TENNIS MATCH** 2 p.m.
Nortronics SSD-Norair

11 a.m. **GAMES** 12 noon
Boys and Girls
Ages 2-10

11 a.m. **SUR PRIZE GAMES** 12 noon

12 noon **LUNCH** 1:30 p.m.
Square Dance Exhibition
Orth Brothers—Accordion
The Pendletons
Bob Taaffe, vocalist

1 p.m. **SUR PRIZE GAMES** 2 p.m.

2 p.m. **FLAG FOOTBALL** 3 p.m.
Norair-Nortronics ES&E

2:30 p.m. **GAMES** 3:30 p.m.
Adults
Boys and Girls, 7-18
Pie Eating Contest

3 p.m. **SUR PRIZE GAMES** 4 p.m.

3 p.m. **KARATI AND AIKIDO DEMONSTRATIONS** 3:30 p.m.

4 p.m. **TROPHY PRESENTATIONS** 5 p.m.
Softball
Tennis
Flag Football
Golf

CLUB EXHIBIT PRIZE DRAWING GRAND PRIZE DRAWING

Remember, the treat is on NRC. Bring the family and friends and plenty of enthusiasm. Pack your own space kit if you wish or get your tickets now at Personnel Activities for service in orbit.

MOTOR-RITE — DON'T METEORITE



AREA MAP

F-5 IMPORTANT MILESTONES

(Continued from Page 1)

first F-5 delivered here has to be a record."

Mr. McCracken speaks with a good deal of authority. He has worked in aerospace manufacturing for over 40 years, here in the United States, Canada, England, and his native Scotland as well.

Corporate Vice-president and Norair General Manager Dick Nolan had high praise for the way the first Palm-dale production F-5 was handled.

He credited Air Force support as a prime factor in first F-5 showing and for the steady overall efficiency of the MAP fighter program.

A FINE START

"We appreciate the assistance and cooperation given by both the Air Force Plant Representative's office here at the plant and the T-38/F-5 System Program director's office at Wright-Patterson Air Force Base," he said. "I wish to thank Colonel Clark and Colonel Hozier, commanders of these two establishments, for their help in getting the F-5 off to such a fine start."

Speaking of Air Force-Northrop common objectives he stated, "We want the F-5 to be the finest weapon system our collective ingenuity can produce. I believe the delivery to the Production Flight facility of this first airplane in 100 per cent completion condition is an indication of a type of performance we can expect throughout the entire program."

D. G. McNeal, director, Manufacturing Control and the man whose AOC system makes it possible to monitor the status of vast production efforts with minute-to-minute regularity, revealed that there are over 15,000 items in manufacture of the F-5. This includes those parts made by Norair, those purchased from outside sources, and GFAE—government furnished aircraft equipment. Standard parts such as rivets, bolts, washers, et cetera are not included.

CAUGHT THE TRUCK

Of these more than 15,000 items, three little parts, an infinitesimal .0002 per cent, kept the F-5 from being absolutely letter perfect. Late arrival caused the three culprits to miss installation. They accompanied the aircraft on the truck, however.

Mr. McNeal recalled earlier days in the industry where production airplanes even in the middle of long runs emerged from assembly lines carrying 200 to 300 shortage tags.

"Without AOC, 100 per cent completion would have been impossible on the F-5," he said. He emphasized, however, that Norair runs the computer systems; the computer systems do not run Norair.

"AOC is a fine tool," he stated, "but it can only help. It can not manage." He then paid tribute to the fine work being done by the Project Coordination group and by Spares, AGE, and GFP, George Reeder and John MacDonald, chiefs, respectively.

"These men were 'on top' of

the program," he said. "AOC told them the story. And if some thing needed to be done they did it. There was coordination and support from all organizations all the way."

MEETS SCHEDULE

Other plant agencies that came in for high praise from Jack Mannion, manager, Manufacturing, were the factory and Materiel. Al Carr, superintendent, T-38/F-5 Forward Fuselage, Wing, and Aft Assembly Operations and Bill Minner, superintendent, T-38/F-5 Electrical and Center Fuselage Assembly Operations, and their men were given credit for meeting exceptionally tight production schedules. Fran Gibian, chief, Materiel Cost Control, and Jack Korbel, chief, Off-Site Manufacturing, Materiel, respectively, were also complimented for exceptional performance in conduct of the Division's extensive outside buying program which forms a large percentage of F-5 airframe and equipment and which helps spread the economic benefits of the contract throughout the aerospace supplier industry.

Mr. Mannion stated, "The F-5 perhaps more than any other Division project, requires know-how, dedication, and a willingness to cope with detail. This is because the airplane will carry the Northrop name to our allies in many far corners of the world. All members of the team know this. Their support of Company and Air Force objectives has been exemplary."

THE F-5 PROJECT OFFICE

Technical's T-38/F-5 Program department, W. E. Woolwine, manager, has also passed some major F-5 milestones.

Mr. Woolwine reports that two highly important meetings with the Air Force were conducted recently with the airplane and its status receiving an A-OK vote by the military commands responsible for conduct of the project.

In the past month, Norair has been host to a 50-member plus team visit for F-5A and B weapon system program review and program implementation. This meeting was headed by Colonel George C. Hozier, T-38/F-5 System Program director, with representatives from General Electric, Headquarters United States Air Force, Headquarters Air Force Systems Command, Oklahoma City Air Materiel Area, Air Training Command, Air Force Contract Management Office, Commander-in-Chief, Pacific; Middletown Air Materiel Area, Aviation Technical Training Center, Air Force Flight Test Center, Aeronautical Systems Division, Headquarters Tactical Air Command, and Headquarters Air Force Logistics Command.

MR. JONES

Heading the Northrop contingent were Company President and Chairman Thomas V. Jones and Mr. Nolan.

Another meeting of extreme importance to the F-5 was the DEI (Development Engineering Inspection) visit, held on September 10, 11, and 12 and chaired by Lt. Colonel J. D. Werlich, deputy director for Configuration

Management, T-38/F-5 System Program Office.

Twenty-eight men from SPO, who with their Norair counterparts in equal number, made up the group which checked the fighter painstakingly and in great detail to make sure all mission requirements would be met and to institute requests for alterations if needed.

Also participating in this session series were Colonel Charles W. Clark, Major T. S. Bean, and Captain R. W. Sirek of the AFPR Office and 33 members of Norair top management headed by Mr. Nolan, by Welko Gasich, vice-president and assistant general manager-Technical, and Bob Lloyd, vice-president and assistant general manager-Operations.

Norair people can now take satisfaction in that RFAs generated during the visit as reported by Sal Xifo, director, F-5A/B Program, were minimal in nature and that the aircraft again emerged with flying colors as meeting specifications for a sound, suitable and potent new weapon system.

PRODUCT SUPPORT

Another F-5 area of intense activity is that of 8800, Product Support department, Frank Mathes, manager.

Teams comprised of Northrop personnel and officials from MAAMA, OCAMA, General Electric, and other responsible agencies have to date made logistics surveys of countries scheduled to become recipients of MAP programmed F-5 aircraft.

The surveys were conducted in depth and provided needed intelligence in many salient areas. The aircraft presently in the inventories of the countries studied—the shops, equipment, supplies, and industrial resources and capabilities—served to provide Northrop and the Air Force with facts upon which to plan for global support of the F-5.

Both supply management and materiel control have been worked out in accordance with the latest state-of-the-art electronic data systems, and significantly, Northrop is currently engaged in the first weapon system application of IDI (Improved Data Interchange) developed by USAF.

Source coding and provisioning conferences have been held and long lead time and high value items identified and procurement orders released.

TRAINING EQUIPMENT

Training equipment designs have been completed and fabrication is well on schedule.

Technical representation plans have been finalized. Key technicians will arrive in the recipient countries in advance of delivery dates to train personnel and help orient and advise so that the new users will be ready to receive the F-5 aircraft and support equipment, and phase it into their air force operations with a minimum of confusion and delay.

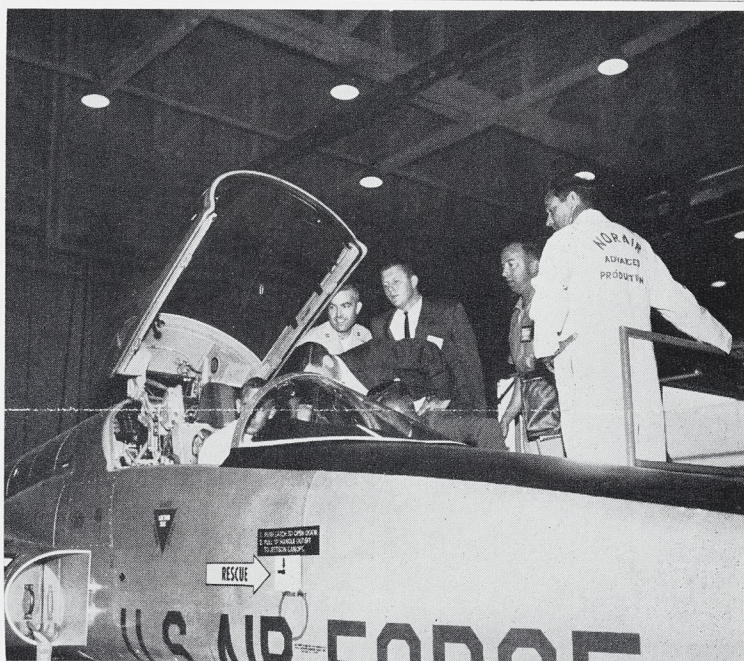
All these actions have taken place. Many more are planned and programmed and will be carried out on schedule.

Each MAP country poses a new operational support challenge—language barriers, climatic en-

Air Force 20-Year Pin



FOR 20 YEARS OF FAITHFUL SERVICE—Major Roy J. Boyd, A-F chief, Quality Assurance Division, Northrop AFPR, presents 20-year service pin to Isabelo Salva, Quality Assurance assistant representative, last week in office ceremony. Other Air Force personnel extending congratulations are Mearle DuHamel, secretary to Major Boyd, and Beverly Pitman, statistical clerk, at left; and at right, P. C. Gill and J. G. Laird, both Quality Assurance representatives.



DEVELOPMENT ENGINEERING INSPECTION—DEI sessions brought Air Force team from T-38/F-5 System Program Office for three-day detailed check of the fighter. Here Air Force officers and specialists give cockpit a thorough going over. Expressions indicate satisfaction.

vironment, social and religious factors to name a few.

A worldwide market for the F-5 program exists outside of MAP nations. Several countries have expressed an interest in buying the F-5 directly from Northrop and have asked for and received quotations for varying numbers of aircraft. Still others are interested in license arrangements to manufacture the F-5.

MAAG representatives (Military Assistance Advisory Group) who serve as in-country military program directors for Military Assistance Programs, collectively visited Northrop in February 1963 where they received a two-day briefing on the F-5 program.

MAAG officers subsequently visited on an individual basis and received more detailed briefings.

MAP PILOTS

Also the governments of the free nations who are to receive the F-5 have sent groups of officials, both civic and military, to Norair to see the fighter first hand and to be briefed on details and particulars of the program. Many rated pilots from MAP countries have had Northrop and Air Force demonstration flights in the supersonic T-38. This is

in order that they gain a "feel" for the capability of the Northrop high performance lightweight family of aircraft, even before their own F-5s arrive.

In addition, a Northrop office of European Support has been established to direct support operations in countries presently scheduled to be among the first to receive the F-5 aircraft.

Support Planning Guides tailored to the requirements of each nation have been prepared and delivered to the users. These planning guides are consistent with the SPP (System Package Program) developed jointly by Northrop Middletown and the SPO and approved by Headquarters USAF. They contain lists of equipment, tools, training equipment and handbooks which will be needed for the F-5. Details of the training programs planned for pilots and maintenance technicians are presented for planning purposes. Each support element is time-phased and event-sequenced to relate to deliveries.

**Buy
Bonds**



RIDES WANTED

8 a.m. — 4:45 p.m.

ROSECRANS & PRAIRIE AVE., Hawthorne. Donna Wray, ext. 1893, 676-6541. 5
NARBONNE AVE. & LOMITA BLVD., Lomita. Bonnie Snow, ext. 2687, 325-3470. 5
TEMPLE ST. & 7TH ST., Lona Beach. G. Psaros, ext. 1348, 433-5512. 5
NEWPORT BLVD. & 17TH ST., Oranage County. L. P. Brewer, ext. 1618, 544-4470. 5

RIDE OFFERED

8 a.m. — 4:45 p.m.

POMONA OR COVINA AREA via San Bernardino Fwy. Duane Heise, ext. 2483, 354-2695. 15
TEMPLE ST. & 7TH ST., Lona Beach. G. Psaros, ext. 1348, 433-5512. 15
NEWPORT BLVD. & 17TH ST., Oranage County. L. P. Brewer, ext. 1618, 544-4470. 15

BBSF Classified Ads

BBSF classified ad service is provided free of charge to all Northrop Norair personnel.

Ads for agencies, commercial enterprises and private businesses are not accepted.

Deadline is noon Wednesday, one week before publication.

FOR SALE

CAMP REFRIGERATOR, Sears, works on Bernz-O-Matic bottled gas or 110 volt, approx. 2 sq. ft. cap., ideal for isolated areas, \$50. 754-4384. A
FORD, 1953 2-dr. sedan, stick, \$100 or best offer. DA 7-9934. A
LAMPS, matched pr., red Chinese, modern, \$6; lawnmower, \$7.50; car cooler, 12-v., \$15. 324-1016. A
BUICK, Riviera, 1950, recent ena. o/haul, good trans., auto., fully equipped, \$100. 376-7205 after 6 p.m. A
VOLKSWAGEN, 1962 sedan, r/h, 28,000 miles, \$1550. FR 7-2160. A
STOVE, O'Keefe & Merritt, apt-size, gas, \$50; rug, 14'x16' nylon, \$20. 831-9589. A
DRAFTING MACHINE, Bruning, 30" & 24" arms, \$80. 676-6930. A
FORD, 1951 Woody, \$395. ME 3-2990. A

WASHER & DRYER, comb., Philco, \$150. OS 5-6254. A
FORD, 1961 convert., p/steering & brakes, \$1500. FR 7-3888. A
FORD, 1959 4-dr. station wagon, auto., r/h, \$950. 673-2158. A
AUSTIN HEALEY Sprite, 1959, \$825. 370-3961 evenings. A
FORMAL DRESSES, 6, 4 st. length, 2 floor length, 1 dress \$25; all others \$10 & under. 755-3805. A
HOME, 2-bdrm. & conv. den, heated pool, carpets, drapes, Hi-Fi, auto. dishwasher, disposal, Westdale district, 80% financing, \$8300 down, \$41,500. EX 7-6791. A

CHEVROLET, 1956, 2-dr., floor shift, \$450 or best offer. OS 6-1475 evenings & weekends. A
CHEVROLET, 1959, Bel Air 2-dr. sedan, V-8, stick, \$1000. 370-1781. A
T-BIRD, 1960, h/top w/sun roof, full power, r/h, approx. \$800 equity plus take over credit union loan, \$1850. DA 6-5558. A
DRYER, Bendix gas, \$30; utility box trailer, 4'x8', \$125; dishwasher, Youngstown, \$40. 676-1471. A
BURCHCRAFT, 18'. Mercury 400 outbd., trailer, lae. wheel, \$895. DA 7-0304. A

BICYCLE, boy's, 24", J. C. Higgins, \$10. DA 9-1742. A
MGA, coupe, 1957, 27,000 miles, \$800. DA 9-1705. A
CADDILLAC, Coupe DeVille, 1958, factory air, elec. eye & windows, \$1695. DA 9-9407. A
BOX SPRINGS, Simmons, & mattress, med., dble. bed, \$45. 377-5936. A
PONTIAC, Safari wagon, 1962, air cond., p/steering & brakes, Hydramatic, many extras, \$3175. GE O-9354. A
POODLE, miniature, white, male, 2-yr-old, has all shots, \$50. FA 8-5581. A
SUIT, blue flannel, boy's size 8, \$5. 371-9651. A
FIAT 600, 1960, 2-dr., \$300. DA 9-0314. A

SURFBOARD, 9' Dewey Weber, \$85. FR 6-9173. A
BEDROOM SET, box springs & mattress, dresser & chest of drws., \$125. 679-2983. A
CHEVROLET, Impala, 1961, 4-dr. h/top, 283 cu. in. ena., p/steering & brakes, r/h, \$1900. PR 4-6868 after 6 p.m. A

FOR SALE

RANGE, Wedgewood Futura, gas, \$150. 833-0736. A
BOAT, 15' Fisherman, 30-hp Johnson, port. bait tank, trailer, \$385. 371-9730. A
TV, 21" Zenith, 2-yr-old, table model, \$125 or best offer. 671-8553. A

SURFBOARD, 9' 4", Shark, \$70. 371-5308. A
CORVETTE, 1959, auto. trans., r/h, \$1700. EX 7-6000. A

REFRIGERATOR, gas, Servel, 9 cu. ft., \$35; sprina horse, Cals Colt, \$5. Box 1801. A

FORD, 1955, 4-dr. sedan, r/h, o/drive, \$300; encyclopedia set, Americana, 30 vols. & annuals, \$125; vise, steel, 3 1/2" jaws x 6" opening, \$7.50; grease gun, Hi-pressure hand-type, \$2; sander, orbital, \$5. OS 9-8993. A

PONTIAC, Chieftan, 1957, 2-dr. sedan, \$150. FR 9-4517 after 6 p.m. A

OUTBOARD, 15' plywood hull w/ glassed bottom, Evinrude, 25-hp, Gator trailer, \$495. ME 3-1350. A

CRIB, \$5; enlraer, Aarus, \$5; refriera-tor, Coldspot, 11 cu. ft., \$30. FR 2-5461. A

MOWER, hand-type, 18", \$5 or reasonable offer. OR 2-3643. A

CHORD ORGAN, Performa, 40-bass, \$35. FA 0-2862. A

CADILLAC, Coupe DeVille, 1961, factory air cond., auto. pilot, full power equip., \$3895. 377-4207. A

FREEZER, 7', commercial-type, \$125. OS 5-6081. A

BABY BED, \$12; play pen, Babyline, \$17. HA 5-6996. A

RANGE, GE electric, \$75. 671-0753. A

DAVENPORT, rose colored frieze, modern, \$69.50. 326-4379 after 4:30 p.m. A

CHEVROLET, 1954, 2-dr., heater, \$200. 676-5296. A

MATERNITY CLOTHES, size 10-12, capris, blk., \$1; smock, \$1; shirt, blk., \$1; bathing suit, \$3.50. FR 1-9730. A

CHEVROLET, Tudor V-8, 1957, r/h, Powerglide, \$550 or best offer. FR 5-5139. A

BOAT, 14', 25-hp Evinrude, elec. starter, trailer, \$275; Ford 1958 convt., T-Bird ena., \$695. 322-0646. A

FORD, 1/2-ton pickup, 1957, heater, \$695. FR 7-1074. A

FORD, 1958, 4-dr., new ena. & paint, rebuilt trans., \$700; bicycle, Schwinn Superior, 15 speeds, \$90. 371-6775. A

CHEVROLET, Bel Air, 1956, convert., V-8 ena., Powerglide, \$500. FR 6-8574. A

COINS, BU 1960 P pennies in tubes, \$1.25. Box 1802. A

CADILLAC, 1960 h/top, factory air, many extras, \$3100. DA 3-3724. A

ACRES, 5 level, Sportsman's Paradise, terms, low down, \$975; Tote Gole w/ 3-sp.d. trans., rack, \$325; pup, Labrador & golden, 5-mos-old, female, \$45. FA 0-2097. A

DAVENPORT, provincial, wing back, \$50. 325-3865. A

CORVETTE, 1954, orig. model 6-cyl., Powerglide, 2 tops, rebuilt ena., \$950 or offer. FR 5-7038. A

DIAMOND WEDDING & enqaament rings, white gold, cost \$350; \$225. 370-1013. A

AUSTIN HEALEY, 1960, 3000 Delux 4-seater, o/drive, wire wheels, \$1695. OW 7-3328 after 6 p.m. A

BUICK, Riviera Roadmaster, 1955, full power, new brake drums and brakes, \$395. FA 1-0020. A

TRIUMPH TR-3, 1959, r/h, all extras, good tires, \$1095; stove w/ariddle, \$35; washer, auto., \$25; bicycle, boy's, 20", \$10 or last 3 items for \$55. 375-7168. A

CHEVROLET, 1957, Bel Air, 2-dr. h/top, Powerglide, power brakes, V-8, \$500. 370-3458. A

HOUSE, 4-bdrm., beamed ceiling, fireplace, 2-car garage, sprinklers, pool, 16'x34', heated, dishwasher, elec. kitch., 1 1/2 baths, air cond., \$31,500; sewing machine, White, \$25; dryer, Hotpoint, elec., \$60; rugs, w/pads, 11'x15', \$25; oval, 10'x13', \$25; couch, Danish modern, \$115; bookcase, \$20; dining table, leaf, 6 chairs, \$50; refrigerator, Cold-spot, \$65; coat, lona, red fox, size 12-14, lady's, \$50; misc. items. EM 2-9380. A

LINCOLN CONTINENTAL, 1958, convt., new top, air cond., all power, new tires, \$1500. PL 2-7995 after 4:30 p.m. A

APT., bachelor, 3-bdrm., aarae, 1 1/2 baths, walking distance from Northrop, corner R-2 lot, \$27,950. OS 6-2873. A

VOLKSWAGEN sedan, 1962, \$1600. DA 4-7623. A

CHEVROLET Impala, 1961, 2-dr. h/top, air conditioned, Powerglide, p/steering, \$2200. 354-2695 days. A

FORD, Fairlane, 1957, r/h, auto. trans., p/steering & brakes, \$700. 830-1094 5 to 8 p.m. or weekends. A

WANTED TO BUY

AMPLIFIER, guitar, elec., Gibson or Fender w/foot vibrato. 757-6960. B

LAND, approx. 10 acres, unimproved, between San Luis Obispo & San Diego. OS 5-9695. B

EXERCYCLE, all body action model. 835-1031 after 5:30 p.m. & weekends. B

CAMPER, Tuk-A-Way or Alaskan, 8' model. OS 6-8331. B

NRC Offers Charm Class For Ladies

The Northrop Recreation Club, Bernie Doyle, president, announces that the current edition of "Charm at Work" sessions will begin Wednesday, October 16, from 5:30 to 7:30 p.m. at the NRC Clubhouse.

The Norair lady self-improvement course, arranged in cooperation with the Education and Training group, will be conducted by Yvonne Rich, who is known throughout the Division for her work during the past two years in the secretary orientation program.

The course, as in previous years, is designed with accents on personality, wardrobe, grooming, attitude, ability to communicate, general appearance, posture and decorum. Live demonstrations of hair styling, make up, and modeling as well as extensive individualized instruction will be a part.

The class, a two-hour meeting each week for eight weeks, is limited to 20 persons. The cost is \$20.

Registration at Personnel Activities is on a first come, first served basis.

Because of the anticipated demand for "Charm at Work," registrations for a second group of 20 will also be taken. This will be Tuesdays, 5:30 to 7:30 p.m., also at the Clubhouse, beginning October 15.

FREE (to be given away)

KITTENS, part Siamese. DA 9-6513. D

RENTALS OFFERED

APTS., 1-bdrm., new, ultra-modern, pool, patio, lawndale, from \$120. 326-0474. E

HOUSE, 1-bdrm., furn., elec. kitchen, adults only, \$85. mo. PL 6-0480. E

APT., 1-bdrm., all elec., drapes, built-ins, FM radio, closed aarae, South Bay area, adults, \$110 mo. 371-6168. E

APT., furn., living rm. w/Hide-a-Bed, kitchen & break. nook, patio, gas & water paid, close to freeway, no pets, \$75 mo. EX 8-2488 evenings. E

APTS., furn., 1-bdrm., ground floor, closed aarae, adults, no pets, 10 min. to Northrop, \$100. OR 2-2555 after 5:30 p.m. or weekends. E

APT., 1-bdrm., Gold Medallion, enclosed aarae, Torrance Del Amo area, \$110 mo. 371-5037. E

APT., bachelor, furn., 1 man only, \$55 mo. OS 6-5921. E

APT., 2-bdrm., built-ins, enc. aarae, sundeck, walking distance to Northrop, \$115 mo. 679-4867 after 6 p.m. E

APT., 1-bdrm., sep. unit near Northrop, \$65 mo. 675-2305. E

COLLEGE GRAD, male, wants to share apt., Manhattan Beach, furn., \$60 mo., aae 26 or under, no aarae. Box 1803. E

PERSONALS

ANYONE witnessing automobile accident on August 14, 7:40 a.m. at intersection of 122nd & Prairie, please call Victor E. Kaplan, OL 3-2822. Autos were a green 1958 Nash Metropolitan & a 1962 Comet. L

I WISH to express my deep appreciation to all the wonderful people for their kindness & aid during my husband, Gil's illness & death. IRENE GORDY. L

WE WISH to thank all our friends for their kind expressions of sympathy during the recent death of our son. MR. & MRS. J. D. CLEMENS. L

SINCERE appreciation for expressions of sympathy due to the loss of my beloved father. DONALD BRENNAN. L

I WISH to thank NRC & all my friends at Northrop for the many cards & gifts I received while in the hospital & convalescing at home. KAY JOHNSON. L

FOR SALE OR TRADE

STOVE, gas, Gaffers & Sattler, \$125 or trade for refrigerator. 323-2754. M

SIMCA, 1959, 4-dr. Delux, \$395 or trade for heavier car. 564-7288. M

NORAIR SCOUT EXPLORER POSTS SET FOR 1963-64

A look into the future in either aerospace science or production management is offered to high school junior and senior boys through the 1963-64 edition of the two special interest explorer posts sponsored by Norair.

Sons of Northrop personnel are invited to take part and will be given first preference to openings in the two groups according to Chairmen Ed Nolan of Production Management, and Charles Eyres of Aerospace Sciences planning committees.

Under the auspices of the Boy

Courses in Mineralogy Start Now

A real goody is coming up for the NRC Gem and Mineral Club, it is announced by Dan Kozlow, commissioner.

There will be a 15-week series of mineralogy and geology classes held at the NRC Clubhouse. Instructor will be Wally Ford, well known El Camino College professor of geology.

Cost will be \$5 for the entire session.

Signup night is tonight, during the regular G&M Wednesday Clubhouse meeting. Time is 7:30 p.m.

Class schedule is as follows:

Monday, October 21. Tuesday, October 29.

Mondays, November 4, 11, and 18. Tuesday, November 26.

Mondays, December 2, 9, 16.

Mondays, January 6, 13, and 20. Tuesday, January 23.

Mondays, February 3 and 10.

EXTRA LEAGUES BEING FORMED BY NRC BOWLERS

As a special convenience for bowlers who failed to sign on one of the NRC winter leagues, Bill Myerson, commissioner, announces two new aggregations of mixed fours.

Whether or not they are formed depends on the number of bowlers signing up, he states.

One league is scheduled for Paradise Bowl in Westchester. It will start October 21 with entries to be in Personnel Activities October 18.

There will be trophies, a buffet dinner and a \$200 sweepstakes drawing.

Cost of the Paradise Bowl will be \$2.25 with \$1 a point prize money. Time is 6:15 p.m. on Mondays.

The second mixed four league will play at the Tropicana Bowl, Imperial and Prairie.

This will be a 550 maximum.

Starting date is pegged for October 24 with entry deadline October 17. Cost is \$2.50 a person with 75 cents prize fund.

Time at the Tropicana is 6:15 p.m. on Thursdays.

The two new leagues are offered for beginners or experienced bowlers. Each team will consist of two men and two women either as entry signups or individuals.

The entire family, including grandpa, grandma, boy friends, girl friends, and neighbors, can participate.

Entry forms are at Personnel Activities.

Scouts of America, the Explorer Posts offer to a young man a depth experience within an occupational field in which he is interested. Norair's Production Management group plans to meet every two weeks, from 7:30-9:30 p.m. on Wednesday nights for 15 sessions during the school year.

They will cover a variety of topics from planning through delivery of aircraft and will include several field trips during the year.

The Aerospace Sciences group, which continued through the summer from its start last spring meets on alternate Tuesday evenings and is dividing forces to accommodate boy interests in six scientific specialties. These include laser techniques, propulsion, ground effects, data reduction computing, wind tunnel models, and wind tunnel operation.

Refreshments are served at the close of each session, and presently permanent facilities are being sought for the explorer groups. Northrop personnel with sons who are high school juniors and seniors are invited to contact Norair Personnel Activities office for application blanks.

KORLA PANDIT ORGAN CONCERT AT ELKS CLUB

The NRC Organ Club has formalized its fall program, it is announced by Gail Skinner, commissioner, and a highlight of the season will occur Friday, October 25, when Korla Pandit, internationally known organist, will appear.

The affair is a joint effort being put on by the NRC Organ Club and the Inglewood Elks Lodge.

Mr. Pandit has appeared in over 900 live solo telecasts. One of his accomplishments and one that captivates all audiences is playing the piano and organ simultaneously. His interpretation of oriental music brings rave notices. He is equally adept at rendering classic and popular numbers.

Tickets are \$2.10—at Personnel Activities office. Sale is being limited to Northrop personnel and Elks members only, at least until October 12, after which time if the hall is not filled, a public sale will be held.

Capacity of the Elks Lodge is 400 persons. Mr. Pandit's previous concerts have been to capacity houses.

NRC BIBLE CLUB TO STAGE DRIVE FOR MEMBERS

The NRC Bible Fellowship Club with a 10-year plus record of regular daily noontime meetings in the plant, announces a drive to gain new members.

Commissioner C. J. Maguire states that there are presently three groups meeting each day at Plant One and it is hoped to extend this activity both in Tooling and Production shops and in the Technical areas as well.

Complete information is available at Personnel Activities.

The NRC Bible Club is non-denominational.

NORTHROP NORAIR NEWS

Issued biweekly by Norair Division of Northrop Corporation

• Wednesday, October 23, 1963

HAWTHORNE, EDWARDS AFB, PALMDALE

SAN ANTONIO, EL PASO

BETTER WAY NETS \$1958

• Nolan Pledges Support In A-F Cost Program

Northrop Norair under Northrop Corporation's company-wide cost improvement program, last week pledged all-out support in the Department of Defense new plan to improve the government's "take home" share of the defense dollar. Take home share in this case being measured by the actual amount of weapons systems, services, and materiel that America can buy with the tax dollars provided by Congress.

The Air Force, Norair's biggest customer, hopes to achieve savings of more than \$1 billion in this calendar year, expanding this to \$1.5 billion during 1964 and to \$1.72 billion in 1965.

• Lt. General Thomas P. Gerity, deputy chief of Staff for Systems and Logistics, Hq. USAF, has been named Air Force manager for the Cost Reduction Program, the Pentagon has announced.

Acting in unison with the Corporate-wide cost and management improvement program, Corporate Vice-president and Norair General Manager Dick Nolan, immediately put the Division squarely in line with the DOD effort.

He stated, "As with the Air Force, we view the program in three broad categories: to buy only what is needed; to buy at

the lowest sound price; and to reduce operating cost.

"Cost improvement has for many years been a continuing function at Norair," he continued. "In fact, the design philosophy of our T-38/F-5 family of aircraft is based on the low cost concept. In addition our line supervisors and departmental managers have consistently demonstrated that the cost factor ranks equally with schedule and quality in decision making.

"To assist line areas, Division management provides many cost specialist services, tools that range from Target Cost, Value Engineering and Value Analysis to Suggestion Awards and extraneous materials surveys. At least 14 organizations have specific cost improvement responsibilities at Norair.

"To assure even more plant awareness of the government's need for better dollar performance, we have just recently set up a panel of departmental cost coordinators, to be headed by W. L. Sparks, Division Cost and Management Improvement coordinator, who will assemble all cost improvement data and report progress to this office through Tom McCarthy, manager, Administration.

"The entire Division has been (Continued on Page 2)

SHAHAN AND SYME REAP BIG SUGGESTION AWARD CHECK FOR BONDING TUBES IN HONEYCOMB

Two Norair men, A. E. Shahan, Metal Bond shop, and E. R. "Woody" Syme, inspector, Quality Control's Subcontract, Subassembly, and Processing branch, have the distinction of successfully collaborating to earn one of the largest Suggestion Award payments in the history of Northrop Corporation.

Their checks, each in the amount of \$979, totalling \$1958, were presented by top officers in their respective areas, Bob Lloyd, vice-president and assistant general manager-Operations, did the

honors for Mr. Shahan and Bob Catlin, manager, Quality Control, for Mr. Syme.

Only one other award, \$2000, exceeds the Shahan-Syme earnings. This went to H. E. Rutzke and Larry Wiens of Advanced Production last year, for their improvement in airborne mockup material for the Laminar Flow Control airplanes.

A situation in manufacture of the T-38 wing leading edge provided the men with the problem they solved with such remunerative results. Difficulties with split cells in a honeycomb core area which required the bonding of a tube inside spanwise caused rejection and scrap disposition of as high as 20 per cent in completed assemblies.

The problem was severe and critical. Schedules stood to be affected and all plant agencies assigned their best talent in effort to find a solution. Costs for a remedy alone would have been substantial, not counting lost effort and material waste in assemblies already through the shop. And there was no indication that an immediate answer would be forthcoming.

Mr. Shahan and Mr. Syme, teamed to save the day when they suggested that instead of being built of two pieces with a U-shaped slot cut for the tube in one honeycomb edge, the part be converted to a four-piece assembly by cutting the legs from the groove and then bonding the four separate pieces around the tube.

The split cells disappeared.

Engineering studies, comprehensive tests, Quality Control examination proved the Syme-Shahan method sound. Careful cost evaluations were conducted with the resultant good news that the men had earned the second highest award ever paid by the Company.

Mr. Shahan has been with Northrop since March 1947. He has held positions of structural mechanic, structural leadman, and his present assignment, quality mechanic. He has been a prolific contributor to the Suggestion program, having received numerous awards for better ways to do the job. This is not his first honeycomb payoff idea. In March of 1962 he earned \$31 for devising a better honeycomb fabrication sequence. During the six months prior to this he had earned nine separate awards.

Mr. Syme who started his aerospace career with the Air Force as inspector at McClellan in 1951, first came to Northrop in 1957. In addition to his present assignment, he has also been an inspector of machine parts and nondestructive tests. He hails

(Continued on Page 2)

MR. JONES TO SPEAK AT M-C DINNER MEET

Thomas V. Jones, Northrop president and chairman, will address the Management Club's traditional and annual management night dinner to be held on December 6, it has been announced by Prexy Ed Laski.

The affair will be at the Thunderbird International Hotel, 525 North Sepulveda Boulevard in El Segundo.

Ticket and program information is being mailed to all members.

Air Force in Three-Phase Effort to Reduce Costs

Washington (AFNS)—Working with the Department of Defense, the Air Force is currently engaged in an all-inclusive campaign aimed at reducing costs.

The Air Force Cost Reduction Program (CRP) was initiated by Secretary Eugene M. Zuckert at the same time that the Department of Defense announced its overall program. The program is aimed toward improving procurement and logistics management, to reduce the costs of operating the Air Force without reducing operational effectiveness and to provide continuing measures of progress being made toward both of these objectives.

The Air Force phase of the program has three broad objectives: to buy only what is needed; to buy at the lowest sound price; and to reduce operating costs.

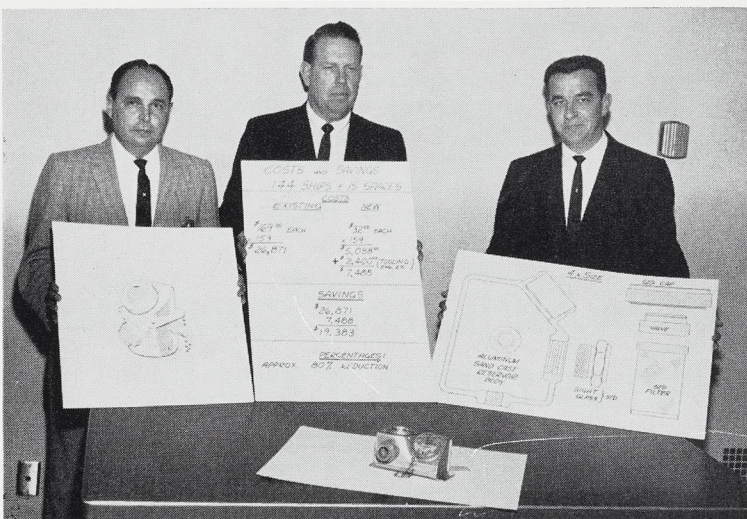
In instituting the CRP, the Air Force emphasized that responsive and economical logistics management has always been a primary Air Force concern.

During the past years, many Air Force programs, both formal and informal, have stressed the urgency of doing a better job for less cost.

The present program provides a common framework into which earlier efforts may be tied and also establishes a continuing

mechanism for recognizing and reporting the results of improved logistics management in specific terms.

The fact that the CRP is now (Continued on Page 2)



REPORT TO PRESIDENT KENNEDY—Norair value team, Dick Donnici, Purchasing; Stan Ryan, Technical; and Ray Staley, Manufacturing; brief Value Analysis seminar on their redesign study of T-38 brake fluid reservoir. Secretary McNamara has reported \$50,400 savings to the President, using case history as example of weapons cost improvement. Norair News first carried cost improvement story based on data furnished by Ken Davidson, Division Value Analysis head. Mr. Ryan recently moved from Norair to a position with Nortronics.

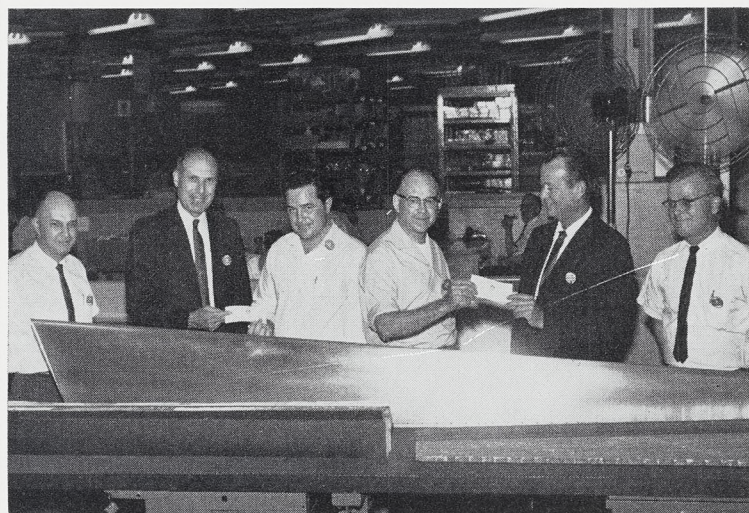
DAYLIGHT TIME ENDS OCTOBER 27

Sunday morning, October 27, at 2 a.m. daylight savings will be no more for the winter months.

At that time, all personnel are advised to set their clocks back

one hour, to 1 p.m., and this will be standard time.

Return to daylight savings time, as provided by state law, will be made April 28, 1964.



CONGRATULATIONS—Norair men, E. R. "Woody" Syme, inspector, 7340, and A. E. Shahan, quality mechanic, 5512, who have joined select list of the Division's champion Suggestion Award winners are congratulated and presented checks totalling \$1958 by top management for their ingenuity in solving a difficult T-38 honeycomb and tube assembly problem. From left, Clayton M. Brown, inspection foreman, Subcontract, Subassembly, and Processing branch; Bob Catlin, manager, Quality Control; co-suggesters Mr. Syme and Mr. Shahan, F. W. "Bob" Lloyd, Norair vice-president and assistant general manager-Operations; and D. G. "Whitey" Reed, general foreman, Metal Bond shop. See story for details. Payment was second largest ever made at Northrop.

Your Paycheck... It Doesn't Tell All

One of the major changes in compensation for your working time and mine has been the advent of what we now call "fringe benefits." It is good to stop occasionally in this fast-moving industry of ours and take stock of our blessings in this fringe area, as well as to think seriously about

Not just one, but two paid vacations each year—a full week at Christmas and a minimum of two weeks and two days of annual vacation.

A liberal group insurance program providing life insurance, hospitalization, major medical and surgical benefits for all personnel

By John B. Clark

Norair Director, Industrial Relations

things we all too often take for granted.

In the first place, what are "fringe benefits"? Ask a dozen people and the chances are you'll get a dozen definitions. They are a real cost of doing business



today, and the definition that seems most acceptable is this: A fringe benefit is a benefit supplemental to wages which is furnished at no cost to the employee, or, in some cases, on a shared-cost basis between the Company and the employee.

The point is that, with all the multiple fringe benefits generally available to the worker today, the figures on a man's pay check simply do not completely tell the story numerically as to what total pay he receives for services rendered his company.

Those of us at Northrop enjoy such as these:

and their dependents.

A generous retirement plan for all personnel, paid for by the Company.

A fair, equitable and just seniority policy.

A conscientiously administered grievance procedure which provides a simple and convenient method by which an employee can bring his problems to an open-minded management which respects his dignity as an individual.

Extensive Company-sponsored recreational activities, community interest programs, and Company services second to none.

The Norair News plans in the coming months to explore in depth the fringe picture at Northrop. In these discussions it is hoped to give background; why we have benefits, why we need them, and many of the interesting facets such as what they do for you, and how to take full advantage.

We think you'll be interested, so watch for the first article soon.

Unique Ideas Highlight A-F Cost Reduction Program

The Air Force Cost Reduction Program (CRP) is calculated to save several billion dollars in manpower, money, and materiel resources, it is stated by the Office of the Secretary through an AFNS dispatch.

From the outset, officials have made it clear that the savings program is intended to reach from the highest to the lowest level of activity. They stress that no area is too small and insignificant to be overlooked and have called on all their personnel to exercise imagination, ingenuity and initiative in the quest for more aerospace power for the least amount of dollars.

Evidence of some unique ideas being put into effect in the various commands highlight the response.

About \$300 to \$400 is being saved because someone realized that a metal collar welded around vehicle tail lights would protect them from being broken when vehicles are accidentally backed into loading docks, pallet loads, rock piles, etc.

Engineers found an abandoned flame chamber from an old jet engine test, a large valve and some steel ducting in the salvage yard. They built a needed wind tunnel for some \$11,000 less than it would have cost using new materials.

Work gloves are generally considered expendable and discarded when thoroughly soiled. Someone

checked and found that the gloves could be economically laundered and reused. Thus far, 9650 pairs have been reclaimed, some several times, at a savings of \$3197.

A \$150,000 fire protection system was designed and built for \$12,000 using an existing 250,000 gallon-per-minute water cooling system at a research and development facility. High pressure fire-fighting deck guns, each manned by one fireman, were tied into the system at 12 strategic points. Each gun is the equivalent of four regular hoses which require two men each to operate.

These relatively small economies illustrate the savings that can accrue through a cost program supported enthusiastically by supervisors and workers.

Air Force

(Continued from Page 1)

being expanded does not mean that present Air Force programs will be replaced or supplanted, the Air Force pointed out. Personnel participating in other programs will review resulting benefits and where appropriate will report them through CRP channels.

The Air Force hopes to achieve savings of more than one billion dollars under CRP this calendar year with savings being expanded to about \$1.5 billion during 1964 and approximately \$1.72 billion in 1965.

Cost Improvement Program

(Continued from Page 1)

alerted to Air Force objectives.

"With the continued fine cooperation of all personnel, we will play an important and productive part in this commendable program," he concluded.

The Northrop Norair T-38 has already been held up to national view as a prime example of what Uncle Sam means in more effective defense procurement. Secretary McNamara, in his first annual cost reduction report to President Kennedy told how \$50,400 was saved on the Talon program by redesign of the brake fluid reservoir to a more economical, more easily produced part with an attendant fluid savings of 13 ounces a ship, 17 to 4.

THREE-MAN TEAM

The suggestion that brought about the improvement was the work of a three-man evaluation team conducting studies as a part of the Division's Value Analysis and Value Engineering programs. Team members were Dick Donnici, Purchasing; Ray Staley, Manufacturing; and Stan Ryan, Technical. Norair head of Value Analysis is Ken Davidson.

The redesign was a product of Technical's Mechanical Design group, Chal Strayer, supervisor. Bob Young was lead engineer on the work. Evaluation was audited and finalized through the Value Engineering group, Paul Von Essen, supervisor.

Value Analysis and Value Engineering processes have enabled line organizations to report product cost savings of over \$76,000 during August and September. Forecast is for \$400,000 plus for the calendar year 1963.

\$2000 SUGGESTION

For another typical Norair cost improvement achievement as a result of employee ideas see the \$2000 award story, page one of this issue, where a Division inspector, E. R. Syme, and a mechanic, A. E. Shahan, suggested a change in assembly sequence that resulted in marked savings on the T-38/F-5 lines.

Individual Norair employees will ask the question, "If I have a cost improvement idea, how do I go about reporting it and who do I report it to?"

There are two channels, states Mr. Sparks. Both involve report filling out. Here is how it is done.

First—a new form, Cost Management Improvement Report, 68-238, just hot off the press and designed specifically for the current program is now available from organization clerks. Fill out this form completely and your cost saving suggestion becomes a formal part of the Division effort.

GETTING ON THE TRACK

Always consult with your supervisor early in the thinking stage. He will help put your idea to work and get it before the coordinators for evaluation and report to management on the savings involved. Management will then report to the Air Force

and this process, on an industry-wide basis, will provide the government the vital economic information that is needed.

American taxpayers become shareholders in this giant enterprise. "Dividends" that result from cost improvement ideas accrue in more defense weapons for dollars spent, perhaps even a tax reduction for individual wage earners.

Secondly — all personnel who are eligible, are urged to examine their ideas carefully for Suggestion Award possibilities. If the person who originates the idea thinks that it might qualify for award payment, he should submit it again only this time on Form 60-35 available from organization clerks or from regular Suggestion boxes posted strategically throughout all plants and facilities.

Not all cost improvements stem from employee ideas.

LARGE SAVINGS

Large savings result from product symposiums, team studies, computer findings, and methods adopted from other companies.

Norair maintains many functions, some full time and exclusive, in support of line organizations, providing services to help pave the way for Division cost efficiency.

These include:

Conservation and the Conservation Digest, Organization 1210, phone 4072 — conservation of manpower, materiel, improved quality, and news on better ways to do the job. The Conservation Digest is Corporate sponsored.

Northrop Norair News, Organization 1293, phone 2456—news on Division cost improvement programs.

Management Systems Research, Organization 1400, phone 2641 — overall management efficiency studies.

Technical Administration, Organization 3910, phone 4040 — initiates studies for cost improvement and efficiencies in Technical management areas.

Value Engineering, Organization 3965, phone 1815 — cost improvements in design and in materials used.

PACE, Organization 5110, phone 1420—utilization of manpower.

Value Analysis, Organization 5120, phone 3-621 — product studies to reduce procurement costs; cost improvement training programs.

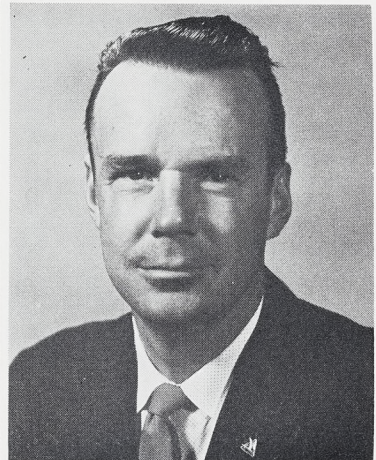
Industrial Engineering Service, Organization 5125, phone 1443

— manufacturing cost improvement programs.

Manufacturing Research and Development, Organization 5150, phone 1791—more economic factory methods and processes.

Project Methods, Organization 5220, phone 2572—tooling efficiencies.

Tool Engineering Procedures, Organization 5240, phone 1847—



WARREN SPARKS

publishes tool manuals and conducts systems cost improvement studies.

AOC Operations, Organization 5310, phone 1814—manufacturing control efficiencies.

Materiel Cost Control, Organization 6400, phone 3-677—cost programming and procurement efficiencies.

Programs and Requirements, Organization 8890, phone 531—product and field support cost improvements.

Business Systems Engineering, Organization 9020, phone 646—Division information systems efficiencies.

This is not a complete list of Division cost improvement support agencies, Mr. Sparks has emphasized. "Practically everyone in the Division contributes to the program," he stated. "The foregoing are some of the key areas and serve to illustrate how comprehensive Norair's program is. If any of the organizations listed can help with cost improvement ideas or suggestions, please feel free to call."

Big Award

(Continued from Page 1)

from Wyoming where he grew up on his father's ranch in Lyman.

He was educated at El Camino College where he majored in mathematics.

This suggestion award is his first.

Order Christmas Trees Now At Personnel Activities

Buy your Christmas trees early, and buy them from us say Personnel Activities folk.

An advance order assures Norair families that the living room will sparkle with piney woods cheer and in plenty of time for the buildup to Santa's yearly visit.

Trees are to be ordered at plant Personnel Activities offices, money paid in advance, with purchase deadline pegged for Friday, November 1. A receipt will be issued and it should be kept. When the trees are received, approximately December 13 to 15, purchasers will be advised by postcard. Postcard and receipt should then be taken to the Christmas tree lot as indi-

cated and a happy Douglas fir will be waiting.

Proceeds of the sale will be used in support of NRC sponsored boy and girl scout groups.

Prices—2 to 3 feet, \$1; 3 to 4 feet, \$1.50; 5 to 6 feet, \$2; 7 to 8 feet, \$2.50. Wooden stands are 25 cents extra.

"BALLOWEEN" BALL SET FOR NEXT SATURDAY

The NRC annual "Balloween" ball will be held Saturday, October 26 at the NRC Clubhouse, it has been announced by Bernie Doyle, NRC president.

This is a combined Norair, NSL, Nortronics ES&E affair.

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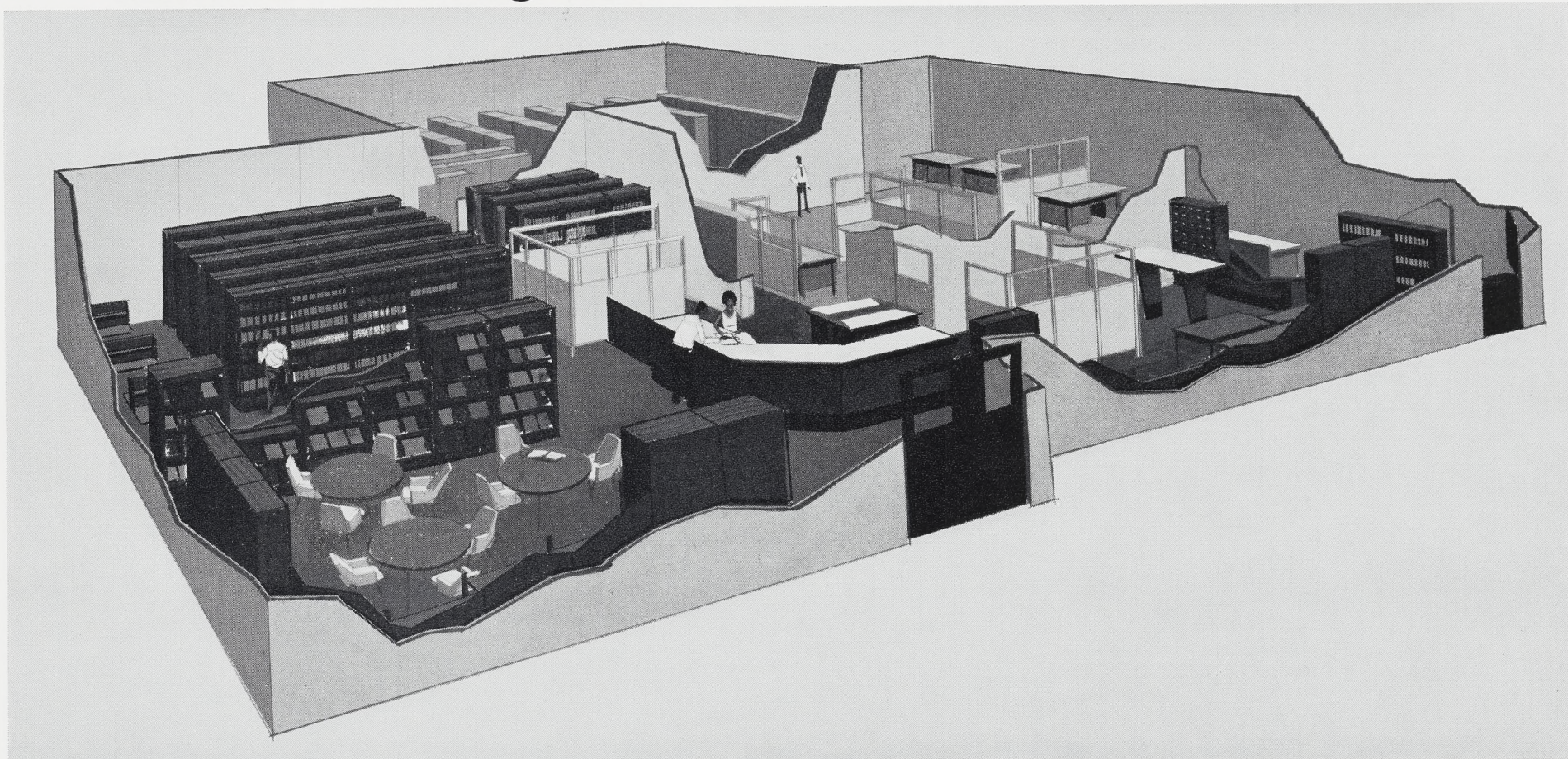
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CHARLES BRADFORD, Editor

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Artist's Drawing of Norair's New Technical Library



FIVE THOUSAND SQUARE FEET—Over 100,000 pieces of aerospace literature, a new and modern information system, specialists to serve you.

Norair Technical Library Expands, Moves to New Area

The Northrop Norair Technical Information library has been relocated to the second floor of the Engineering and Science Center, northwest corner, it has been announced by Welko Gasich, Division vice-president and assistant general manager-Technical.

Immediate Technical plans are to add substantially to the library's already comprehensive list of over 100,000 military and scientific publications.

"The library expansion and modernization program," stated Mr. Gasich, "aims to provide Norair Technical personnel with one of the most up-to-date engineering and scientific information systems available in the aerospace industry."

"Requirements have been urgent for unlimited availability and quick access to reports, periodicals, and advanced literature on the technologies."

"It is also vital that we have a protected reading area, completely free from distraction so that our people can productively concentrate in the studies and research so necessary to progress in this day of exploding knowledge and a fast-moving aerospace industry."

"We believe the new library will fulfill these needs admirably."

"The Technical organization extends an invitation to all Norair personnel to visit and make use of the new unit."

To accompany this growth, increased literature searching activity and bibliography preparation will be implemented with the acquisition of additional professional specialists in this field.

The NASA information program which provides indexing and abstracting journals for locating technical reports as well as 5 x 8 flat sheet microfilm copy of the complete report is now available for use.

A Xerox copier, conveniently located adjacent to the library, is now available to patrons for timely reproduction of significant

pages from books and periodicals which are located on the library shelves.

Other plans include (1) the preparation and publication of a library users' brochure which will inform Norair personnel of the service and capabilities of the library; (2) increased inter-divisional cooperation and exchange of information among libraries; (3) system studies relative to mechanization of library activities, including information retrieval; and (4) increased linguistic capability for translation of technical documents.

Another improvement initiated with the recent move was the consolidation and centralization in the handling of military specifications, USAF technical orders and other military manuals, regulations, and standards. This important aspect of the library activity now offers service directly from its own Dutch-door counter in the vault area, thereby providing much more rapid and efficient handling of these publications.

Many Technical Information unit staff members are active in professional library societies such as the Special Libraries Association, the American Documentation Institute and the American Library Association. H. W. Jones, Technical Information unit supervisor, is a member of the Pacific Aerospace Library committee of the AIAA, and represents Norair in its institutional membership in the American Documentation Institute.

The library frequently uses the resources of local special, public and university libraries to help in satisfying the needs of patrons. Cards are held for UCLA, USC, Cal Tech, Los Angeles public and county libraries, any one of which may be used by Norair employees who have the need.

Special libraries of other companies are also used in obtaining material. The Pacific Aerospace Library is a "mail order" type service.



THE STAFF—Norair Technical's Information unit specialists pose for photo in new location, second floor, Engineering and Science Center. From left, seated, Wynema Epps, technical orders; Joyce Mackey, organization clerk; Isabel Carson, circulation; Pat Gryder, acquisitions; Ruth Lindstrom, technical orders; Rita Scott, periodicals; Terry Grosberg, cataloging; and H. W. (Bill) Jones, supervisor. Standing, from left, Mary Foote, specifications; Helen Callaway, circulation; Celia Alper, reference/research librarian and linguist; Marie Manson, cataloging; Rose Gibbs, acquisitions; and Peggy Seager, cataloging librarian. Not in photo, Virginia McGill, circulation.

INDEXING SYSTEM—Peggy Seager explains Technical Information unit's indexing system to Dr. C. W. Chu of the Gas Dynamics branch. Library plans point to a modern efficient information system with unlimited facilities for securing world knowledge on all aerospace matters.



REFERENCE SECTION—Here Celia Alper, left and Mr. Jones, right, provide library references service for Julian Morawski, Structural Analysis, as he seeks data for a Division product study and design.





RIDES WANTED

7 a.m. — 3:45 p.m.

HAWTHORNE & 190TH, Redondo Beach. Darlene Richardson, ext. 2520, FR 9-5164.

PACIFIC COAST HWY. & PIER AVE., Hermosa Beach. Sarah Weatherington, ext. 1860, 376-1467.

LINCOLN BLVD. & MANCHESTER AVE., Los Angeles. J. Sequer, ext. 1942, OR 0-2564.

MANCHESTER & VAN NESS AVE., Inglewood. Wade C. Erickson, ext. 503, PL 2-7995.

7:30 a.m. — 4:15 p.m.

FALLBROOK & VAN OWEN, Canoga Park. V. Stockard, ext. 1814, 347-4200.

SEPULVEDA & CULVER BLVD., Culver City. E. D. Peden, ext. 4284, EX 1-7014.

FLORENCE & VERNON, Los Angeles. Clary W. Adams, ext. 691, PL 9-6374.

ORANGETHORPE & VALLEY VIEW, Buena Park. Howard Lavelett, ext. 4004, 522-1897.

8 a.m. — 4:45 p.m.

ORANGE & BALL RD., Anaheim. P. M. Olson, ext. 2641, 772-4588.

NORMANDIE & 93RD ST., Los Angeles. Vicki Fox, ext. 1755, PL 6-9611.

VINELAND & MAGNOLIA, No. Hollywood. Michael G. Sirmeyer, ext. 1481.

GARDEN PARK ESTATES, Garden Grove. Wm. E. Moran, ext. 735, 892-1319.

RIPLEY AVE. & CLARK LANE, Redondo Beach. Share driving. David Porter, ext. 1428, FR 9-0579.

RIDE OFFERED

7:30 a.m. — 4:15 p.m.

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BBSF Classified Ads

BBSF classified ad service is provided free of charge to all Northrop Norair personnel.

Ads for agencies, commercial enterprises and private businesses are not accepted.

Deadline is noon Wednesday, one week before publication.

FOR SALE

WASHER, Kenmore auto., \$40; chair w/ ottoman, \$10; rug, 9'x12', brown, \$10. 379-2796.

DODGE, 1957, 4-dr., 1 owner, \$465. OS 5-6016.

DISHWASHER, portable, Sears Kenmore 600, 1963 model, \$135; range, GE elec., \$125. 329-0037.

SHAVER, Norelco elec., dual floating heads, \$12.50. FR 2-0649.

DRAPERIES, 1 pr., ivory color, \$35; 2 bar stools, beige tones, \$25. AX 4-9294.

RUG, wool braided, 12'x15', brown & beige, oval, \$75. 376-1583.

PORSCHKE 1600, 1957, coupe, rebuilt eng., \$1800. 324-8520.

PONTIAC, 1962 2-dr. h/top, 4-spd., alum. wheels, \$2500 or best offer. 329-1574.

VOLKSWAGEN CAMPER, 1962, \$1850. 756-7125.

BABY FURNITURE, crib & mattress, playpen, stroller, high chair & buggy, \$35; playhouse, 5'x8', \$75. PL 4-5909.

GOLF CLUBS, 2 sets, 1 w/cart, \$50 & \$30. 375-5684.

OLDSMOBILE 1956, power steering & brakes, \$250. FR 5-0061.

HOUSE, in Southwood area, 3-bdrm., 2 baths, 2-car garage, landscaped, w/w carpeting & drapes, \$22,950. 371-2570.

BUICK, Super, convt., 1956, full power, r/h, \$395. PL 6-4978.

CORVETTE, 1958, 230-hp, 3-spd., \$1850. NE 2-7635.

STOVE, Frigidaire, elec., \$40. 676-9678 after 4:30 p.m.

BICYCLE, girl's, 26", carrying basket, \$20; drafting machine, Brunina, 18" arms, plastic scales & French curves, \$60. AX 1-7438.

FOR SALE

CORVETTE, Sting Ray, 1963, convt., hard & soft tops, 300-hp engine, 4-spd. trans., r/h, \$3900. 377-6598.

TR-3, 1958, 4 new tires & battery, port. luggage rack, r/h, \$950. 676-6058 after 5 p.m.

TYPEWRITER, Remington Noiseless, portable w/case, \$25. FA 8-0460.

STOVE, 30", full-size oven & broiler, \$35. 671-1130.

FREEZER, 22 cu. ft., Frigid. Shelf upright, 2-yrs-old, will deliver locally. \$200. 847-5232.

FORD, 1957 2-dr. Fairlane, new w/w tires & paint, r/h, power steering & brakes, \$600. PL 4-1715.

FILING CABINET, 4-dwr., beige, \$45; floor lamp, \$5; table lamp, \$3. 325-3659.

ACCORDION, 120-bass Blair w/carrying case, \$95. DA 4-5449.

BOAT, 12', aluminum, Johnson, 5-hp, \$200. TO 7-1459 after 5 p.m.

RANGE, 40" Wedgewood Holly, aas, \$100. 677-3809 evenings.

TOOL KIT, fitted for Volkswagen, & eng. spare parts, \$20; bicycles, boy's & girl's, 24". \$20 ea. FR 5-8804.

BICYCLE, girl's, 26" Monarch, \$25. FR 4-8608.

MOVIE CAMERA, 8-mm DeJur, 3 lenses, 5 spds., zoom view finder, \$35. PL 4-6428.

HALLICRAFTERS, SX110 receiver, phones & Hy Gain indoor antenna, \$105. OR 4-2099.

PIANO, upright, good tone, \$190. OS 5-4948.

FURNITURE, living rm. set, 3-pc. maple, wing back sofa & matching chair, coffee table, \$65; TV, cabinet w/shutter doors, maple, \$35; chairs, 2, Danish modern, \$45 ea.; tables, 3, walnut, \$25 ea.; table lamps, 2, 33" ceramic w/burlap-type shades, \$10 ea. FR 9-4913.

BEDROOM SET, blonde, bed, full-size, spring & mattress, dresser, 2 night stands, \$75; rug, candy stripe, w/pad, 10'x12', \$40; picture, maple frame, outdoor scene, 60"x44", \$25. 323-6074.

SAILBOAT, 12', 4' wide, w/sail, \$100; dinette set, 7-pc., 3'x6' table w/6 chairs, \$50. DA 9-7338.

HAM MOBILE EQUIP., Gonset G66 receiver, Morrow MB560A transmitter, James C1050 power supply, 6/12 volts, all handbooks, \$100. 364-3244.

DIVAN, \$25; step tables, 1 pr., \$25; lamps, 1 pr., \$25, all maple; bassinet, \$5; rugs, 2, 9'x12', \$5 ea.; Chevrolet, 1956 4-dr. wagon, stick shift, V-8, \$550. OR 0-4342.

HOME, Holly Park, 3-bdrm., 1 1/4 baths, many extras, \$25,500; bdrm. suite, brass bedstead & night stand, desk w/chair, \$100; stepladder, 10', \$6. DA 4-4845.

BOAT, 1961 Glastron, 17', walk-thru windshield, extras, 75-hp Evinrude, tilt-trailer, big wheel, \$1800. EX 8-1458.

RIFLE, Stevens, model 85, semi-auto., \$25; pistol, 36 cal., dble. shot cap & ball, ammunition avail., \$25. DA 9-5364.

BED, single, mahog., pillar-type, hand-carved, w/mattress & spring, \$25. PL 7-3595.

CHEVROLET, Impala, 1961, 4-dr. h/top, V-8, Powerglide, power steer. & brakes, r/h, \$1895. DA 3-3251.

SAXOPHONE, Buescher Tenor, \$175; trumpet, Olds, \$95. FR 4-6003.

SURFBOARD, Lyman, 9'6", foam, \$50. 570-1926.

RUG, w/pad, beige, wool, 12'x18', 1-yr-old, \$100. 477-0618.

PATIO TABLE, 5-pc., redwood, benches, 295-9997.

BOAT, 15', open cabin, 30-hp Johnson, accessories, trailer, bait tank, \$380. 371-9730.

WASHER-DRYER, Westinghouse, approx. 5-yrs-old, \$25. FR 5-5760.

SAW, 7", elec., hvy. duty w/ball bearing slip clutch, \$35. 323-3424.

CARBURETOR, Carter AFB 4-bbl. & alum. intake manifold off 1962 Corvette, \$45; carburetor, 4-bbl., off 1962 Oldsmobile Starfire, \$25. 370-3458.

JET PUMP, 1-hp, cost \$150; pipe; 10 galvanized pipe fittings; lumber; 14' ladder, all for \$57.50. VE 7-4237.

MERCURY, Montclair, 1955, 2-dr. h/top, r/h, eng. newly rebuilt, good tires, \$400. OS 5-5978.

TIRE CHAINS, 2, 760-15, \$5; ceramic tile, lt. yellow, 1 1/2 cartons, 15 sq. ft., \$5. FR 2-0448.

HOME, 2-story 1 1/4 acres of land, 13 rooms & basement, Mediterranean Estate, Torrance area, \$100,000. DA 9-1598.

CLOTHES, for Barbie doll, hand-made, 50¢ to \$1.50. DA 9-3721.

ENCYCLOPEDIA SET, Americana, 30 vols., plus annuals, \$125; sander, orbital, \$5. OS 9-8993.

PONTIAC, Chieftan, 1957, 2-dr. sedan, \$150. FR 9-4517 after 6 p.m.

PLYMOUTH, 1956 2-dr. sedan, r/h, good tires, \$100 or best offer. DA 4-5290.

RANGE, Gaffers & Sattler, aas, w/arill, \$35. 679-2983.

FIAT 1100, 1958, r/h, \$425. OR 1-7474.

MG-TF 1500, 1955, \$690. OR 0-5639.

HOUSE, 6-room, fireplace, fruit trees, garden, Torrance area, \$15,500. DA 6-3612.

NRC Fun Fair Fotos

BETTER YET—The NRC Fun Fair picnic, held last week at South Gate Park turned out a big crowd, proved to be the best outdoor get-together yet in the Division's long line of annual potato salad whammeroos. Norair News presents photo montage of the goings on, from pie eating to softball champs. Look close and find your family.

NRC STAMP CLUB TO TAKE PART IN NATIONAL

The NRC Stamp Club will present an exhibit at the National Philatelic show to be held at the Statler Hotel November 8, it has been announced by Commissioner Tom Brazil.

Details will be worked out at the meeting Monday, October 28, 7:30 p.m. at the NRC Clubhouse, 12917 Cerise Avenue.

All Northrop employees and their families are invited to attend.

FOR SALE

DAVENPORT, provincial, wing back, \$50. 325-3865.

LAMPS, matched pr., red Chinese, modern, \$6; lawnmower, \$7.50; car cooler, 12-v., \$15. 324-1016.

PONTIAC, 1962 Safari wagon, Hydramatic, \$3000. GE 0-9354.

WANTED TO BUY

BILLIARD TABLE, DA 9-1742.

FLUTE, 371-6328.

FORD, 1959, V-8, station wagon, country sedan, 6-pass., fully equipped, DU 4-4017 after 5 p.m.

LATHE, metal cutting-type, 12" swing preferred. DA 9-6728.

FREE (to be given away)

DOG, terrier-type, small, brown good w/children, 2 1/2-yrs-old. FR 8-5810.

RENTALS OFFERED

APTS., 1-bdrm., new, ultra-modern, pool, patio, Lawndale, from \$120. 326-0474.

APTS., lae., 2-bdrm., w/w carpets, drapes, built-ins, soundproof, children, walk to Northrop, \$115 up mo. OS 5-6032.

APT., lae., single, Playa del Rey, furn., utilities paid, \$125 mo. EX 8-3840.

APT., 2-bdrm., w/w carpet, drapes, built-ins, disposal, garage, 2 children ok, \$96.50. OS 6-2501.

DUPLEX 1-story, children & pets ok, range & refrigerator avail., Rosecrans Blvd. near Aviation, \$70 mo. 679-8867.

HOUSE, 2-bdrm., newly decorated, close to Northrop, single garage, no children or pets, \$110 mo. OS 6-4741.

HOUSE, 1-bdrm., unfurn., \$65. OS 6-5565.

APTS., Kona Kove, 2-bdrm., lae. patio, Anthony pool, carpets, drapes, built-ins, closed garage, no pets, from \$135. DA 9-5986 after 4:30 p.m.

APT., lae. bdrm., built-ins, drapes, w/w carpet, near freeway, garage, \$95 mo. DA 9-0314.

HOUSE, 3-bdrm., 1 1/4 baths deluxe, elec. kitchen, near schools & shopping, \$175 mo. 371-4797.

HOUSE, lease or lease w/option to buy, 4-bdrm., forced air heat, 2 baths, fenced yard, \$200 mo. w/\$75 mo. credit on option. Box 1901.

DUPLEX, redecorated, lae., 2-bdrm., unfurn., disposal, garage, water & lawn pd., Normandie & 120th St. area, \$100. PL 4-1964.

ROOM, \$50 mo. or will share home w/refined lady, \$75 mo., ref. required, near Peninsula shopping center. PL 9-7829 after 5 p.m.

RENTALS WANTED

DESERT CABIN in Palm Desert area occasional weekends. DA 9-6728.

FOR SALE OR TRADE

GO-CART, Sears-made, \$150 or trade for motorcycle. PL 5-0160.

TABLE SAW, \$35 or will trade for other merchandise; draught beer box, home-made, \$125; refrigerator, beer tap complete, \$89. 371-7878 after 5:30 p.m.



NORTHROP NORAIR NEWS

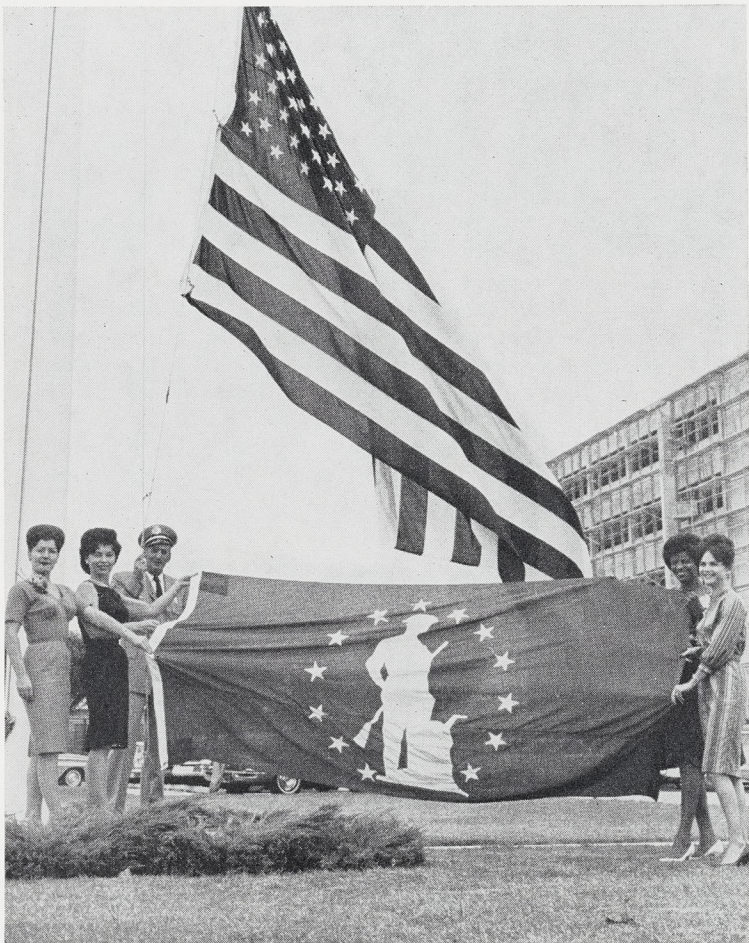
Issued biweekly by Norair Division of Northrop Corporation

• Wednesday, November 6, 1963

HAWTHORNE, EDWARDS AFB, PALMDALE

SAN ANTONIO, EL PASO

The Minuteman Flag



MINUTEMAN FLAG—Norair Division is proudly flying the Treasury Department's Minuteman flag awarded as a result of the 99.6 per cent participation in the recent Freedom Bond drive. Bond-O-Girls who headlined the bond wagon program returned to the scene for photo. From left, Betty Linton, Mae Moore, Helen Townsend, and Nancy Post. Vernon Newcomer, Plant Protection supervisor, does flag raising honors.

Your Trunk is Not "Baggage" Says Safety Council Report

Handling objects is the principle lost time and temporary injury source, says the National Safety Council in its recently published handbook, "Accident Facts."

Falls cause the next largest number, with falling objects and machinery accidents ranking third and fourth in misery.

Fatal injuries, however, belong to the automobile with vehicle mishaps outscoring all other death accidents by one out of five or 20 per cent.

Object handling (manual) in the aforementioned lost time and temporary injury bracket amounted to 22.6 per cent. Automobiles only mustered seven per cent in this category.

The National Safety Council further states that there were over 2,000,000 disabling work injuries in 1962. Of these 13,700 were fatal and 80,000 resulted in some permanent impairment.

What part of the body gets in trouble most? The trunk with 560,000 big hurts during the year.

Thumbs and fingers came next with 340,000, legs were third, feet fourth and hands fifth. Eyes

were last, thanks to the highly successful program of educating industrial people to protect themselves with safety glasses.

At Norair, safety glasses are required in all factory areas whenever you cross the white lines.

Lee Johnson, Norair chief safety engineer, urges that all workers exercise care in lifting materials for here is where the front running trunk injuries occur.

"If we can beat the eye injury problem, we can beat the back problem," states Mr. Johnson. "And common sense is the best tool we have to fight the battle with. Don't lift things that are too heavy. Have good footing when you do lift. Don't out leverage yourself. No horse play.

"Each back injury last year in the United States averaged \$968 in wage compensation alone. Untold thousands of dollars more were involved in other accident byproducts."

Expert safety and medical advice is available to personnel with on-the-job back problems. Safety phone is 567. Medical phone is 631.

TALON VIP FLIGHTS SPREAD HIGH PERFORMANCE FAME

Two VIP demonstration tours have further spread the fame of Northrop's high performance, lightweight twin-jet family of aircraft.

Over 100 flights were made from some of the most important military air bases in the United States.

At the controls at various

times were Congressmen, generals, air officers from allied nations, and prominent civilians in the aerospace industry. All military services were represented; Air Force, Navy, Army, Marine Corps, and the Air National Guard.

Ten of America's astronauts including those who have orbited the earth flew the T-38. Numbered among them was L. Gordon Cooper, jr. who made 22 circuits around the globe. After the flights the spacemen, all top jet pilots, were high in their praise and frank in their admiration of the airplane. Several expressed, as did military personnel from many other commands, the wish that the aircraft be assigned in support of their operation.

Both tours started at Edwards and were in Company-leased airplanes. The first zeroed in on Andrews Air Force Base, Washington, D.C. with demonstration stops coming and going at Olmsted, Eglin, and MacDill. Fifty-eight personages of key importance from government and military circles flew, with many flights directly over the nation's Capitol.

The second tour was tailored to demonstrate the airplane to NASA's astronaut group and to officials of the Tactical Air Command.

Arrangements for the Manned Spacecraft Center visit were handled by the Northrop Houston District office and flight scheduling while there was coordinated by Joe Algranti, NASA

chief, Flight Crew Operations.

One of the way stops was overnight at St. Louis where McDonnell Aircraft Corporation hosted with fuel and starting services. Northrop extends appreciation and thanks to "Mr. Mac" for the cordial assistance and facilities provided by the makers of the Voodoo and the Phantom.

Norair pilots on the tours were Chief Engineering Test pilot Jack Wells and H. E. Chouteau, F-5 Project pilot and supervisor, Flight Operations. Crew chief on both trips was D. D. Wilson flying as observer. Company pilots alternating with Mr. Wells and Mr. Chouteau during the period were engineering test pilots R. G. Thomas and Don Papish.

Ten astronauts flying the airplane were Edward H. White, Walter M. Schirra, jr., M. Scott Carpenter, James A. Lovell, L. Gordon Cooper, jr., Frank Borman, Donald K. Slayton, Charles Conrad, jr., Neil Armstrong, and John W. Young.

California Congressman Pat Martin took a hop from Andrews, see Northrop Norair News, September 25, 1963.

Allied air officials from Canada, Korea, and Turkey took flights.

Generals included Major General Frederic H. Miller, commanding general, Middletown Air Materiel Area; Brig. General G. L. Pritchard, Headquarters SAWC; and Brig. General J. N.

(Continued on Page 2)



M. SCOTT CARPENTER



WALTER M. SCHIRRA, JR.



DONALD K. SLAYTON

A-F Service Honors



AIR FORCE HONORS—A total of 40 years of service in the Air Force was recognized last week by presentation of 20-year service pin to Dorothy L. Minnich, administrative assistant, and 10-year service pins to John T. Nosk, at left, and Thomas T. Okimoto, at right, supervisory auditors of the USAF Auditor General Resident Office. Presentation was made by Eunice E. Stockman, resident auditor. Mrs. Minnich and Mr. Okimoto have been at the Norair resident office for eleven and four years, respectively; Mr. Nosk at the Ventura resident office six years.

Need Trained Computer Men, \$100 Referral Awards Paid

Two new classifications have been added to those eligible for \$100 Northrop referral awards, it has been announced by Dave Stadler, chief, Personnel.

The classifications are "data processing specialist" and "data processing analyst senior."

Referral cards with complete eligibility information are available from organization clerks or the Norair Personnel offices in the Tooling building and in the Engineering Science Center.

Persons referred in the two new categories will work directly for Northrop Corporation and will find substantial opportuni-

ties waiting in the Company's extensive information processing complex.

Computing equipment to be worked with includes the IBM 7090, 7040, and 7044.

Background to qualify requires a degree in mathematics, in engineering, physics, business administration, or in accounting with a minimum of five years experience in the analysis, design, and maintenance of technical or business computing applications.

Programming experience on the 7090 is especially desirable.

Astronauts and T-38



CHARLES CONRAD, JR.



JOHN W. YOUNG



NEIL ARMSTRONG



EDWARD H. WHITE



JAMES A. LOVELL



FRANK BORMAN



TOUR CREW AT NASA—From left, Joe Algranti, NASA chief, Flight Crew Operations; G. R. Van Alstyne, General Electric representative; Norair's Jack Wells, chief engineering test pilot; Astronaut Charles Conrad, Jr.; Norair's R. G. Thomas, tour pilot; E. J. Zimmerman, flight inspector; K. D. Landis, flight mechanic; D. D. Wilson, crew chief; and George Sterling, chief, OPINDOC, Marketing department and team leader. Over 100 VIP flights were made during demonstration tours.



FORUMS FOR BUYERS—Norair Materiel starts series of open forum meetings on advanced procurement methods and the newest know-how in today's subcontracting methods. Materiel Director Carl Hood, standing, reviews use of Division procurement tools during first session. From left, Buyers around the table, C. L. Nelson, R. E. Patterson, T. J. Owens, E. A. Fiorito, D. A. Simcoe, Mr. Hood, L. K. Dunham, E. M. Rossomme, executive staff assistant and small business liaison officer; Buyers T. N. Sellinger, H. N. Arthur, and H. D. Terrazas. Not in photo but attending, Bob Rolfe, chief, Education and Training who coordinated the series; Buyer Don Riddle, and R. W. Geer, general supervisor, Education Services branch.

Materiel Presents Program of Advanced Procurement Forums

Northrop Norair Materiel section has recently inaugurated a series of open forum discussions for selected members of the Purchasing and Control organizations, it has been announced by Carl Hood, director.

Twice each week, a panel of

key management personnel will meet with buyers and other Materiel men to examine and review advanced procurement techniques, procedures, and policies of modern-day government subcontracting. Twenty such meetings will be held, after which

additional groups will be scheduled.

Through cooperation of the Education and Training group, the program concept has been broadened to also include other lateral Norair organizations. This plant-wide approach is aimed at giving the buyer a more comprehensive view of the impact of his procurement function. About 50 per cent of the allotted time will be devoted to guest speakers from lateral groups such as Finance, Contract Pricing, Quality Control, Program Planning, Legal, Value Analysis, Contract Administration, and Reliability. Mr. Hood states, "In addition to strengthening lateral group communication and understanding, the seminars provide a detailed analysis of the buyer's function and responsibility, with free and

Demonstration Tours

(Continued from Page 1)

Ewbank, assistant deputy for Operations, Headquarters TAC.

A random sampling of what they said about the airplane: "A beautiful aircraft, handling characteristics are outstanding."

"I only wish I could be a squadron commander and have a package of these or the fighter version, F-5s."

"Our future flyers should have no trouble with the T-38."

"Should be an outstanding gunnery platform."

"Engine performance outstanding . . . no stalls . . . acceleration the best I have seen."

"Characteristics of the aircraft in slow speed, high G conditions were very good. I noticed

no tendency to snap, spin, or get unruly while hauling the aircraft around."

"Student pilots are flying the best aircraft in the Air Force. After training in the T-38, squadron equipment will be a let down."

"A real going Jessie and a honey to fly. Let's do it again."

"Thanks for the chance to fly the T-38. I hope it is not the last time."

"Cockpit layout very logical and uncluttered. Can you deliver us one next week?"

"Extra range and travel 'baggage' pod makes it just the plane for us."

"Solid little bird under all conditions."

"Great hop."

Air Force and NASA personnel at ports of call made consistently favorable remarks over the fact that the T-38s while on tour required only a bag of hand tools to keep them flying. They recalled that other supersonic visitors had required as high as 25 men, a truckload of spares and a full complement of test equipment.

Final trip report to management on the tours was made by George Sterling, chief, OPINDOC, Marketing department and team leader for the operation.

Norair crew members from Edwards supporting the tours in addition to Mr. Wilson were E. J. Zimmerman, flight inspector; K. D. Landis, flight mechanic; G. R. Van Alstyne, General Electric representative, accompanied the group on both trips.

BUY BONDS

open discussion concerning new approaches, present methods, and existing problem areas." Major topics include corporate policy, Materiel directives, bidding procedure, material cost control, subcontract administration, requirement management, and logistics and accountability.

Individual items for discussion will include small business and labor surplus programming, standards of procurement practice, scheduling and shortage control, target programming, configuration control, vendor evaluation, incentive subcontracting, price analysis, and standardized corporate procurement.

NORTHROP NORAIR NEWS

VOL. 21 NO. 20

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A NORTHROP CORPORATION
PUBLICATION
NORAIR DIVISION
Published every other Wednesday

CHARLES BRADFORD, Editor

Permission to publish material with credit to Northrop Norair News will be granted. News office extension—2456. Outside lines—OR 8-9111, OS 5-4611.

NORAIR'S AIR SEARCH RECEIVER TRACKS DOWN EMERGENCY CALLS



FOUND—Norair Air Search Receiver, newly developed emergency rescue system, pinpoints location of "lost" pilot. White parachute can be seen center of photo at angle point convergence of three dirt roads. "Guinea pig" and man who played part of lost airman was Willard Patton, instrumentation design engineer. Location is Corral Springs, seven miles north of Kernville. He and Mrs. Patton left city at dawn to reach this secret point in time for test. Their pickup is hidden under trees.

On a day in mid-October, a Company Piaggio with a sealed envelope aboard took off from Hawthorne at 1340 hours, and climbed to altitude.

At 1345 Pilot Max Stanley, chief, Flight Support Operations group, opened the envelope.

In it a piece of paper stated that an "airplane" had vanished.

Last known course was 290 degrees out of Mojave.

Last known contact had been calculated at a point 60 miles along this heading.

Would the Piaggio and crew institute an emergency search, find the airplane with all due speed and report?

Roger!

At 1440 hours, 55 minutes later and over 150 miles from Hawthorne, Max and his crew sighted a parachute lying in a deep canyon.

Location, Corral Springs camp, seven miles north of Kernville.

MAN WAVING

They brought the Piaggio down in a tight spiral for better visual and saw a man waving. The man was Norair Instrumentation Design Engineer Willard Patton. His pickup camper was then discovered hidden in the trees. Mrs. Patton was also there. She had gone along for the ride, it being a Friday. They had left Hawthorne long before dawn for Mojave and to a destination completely unknown to become "objects of search".

On that day they served as lost "guinea pigs" to prove the capability of a new safety device for air crews.

Name, Norair Air Search Receiver.

And homing in on the Patton's emergency transmitter with bulldog tenacity and tracking the signal to its source climaxed a two-year long program of development of a very compact and reliable system for emergency and rescue.

WEIGHS TWO POUNDS

Weighing all of two pounds and occupying not over one-half cubic foot of space in any suitable place in the airplane, the Air Search Receiver will receive up to 100 miles, depending on terrain, and with five times the sensitivity—one microvolt to five—of currently available equipment.

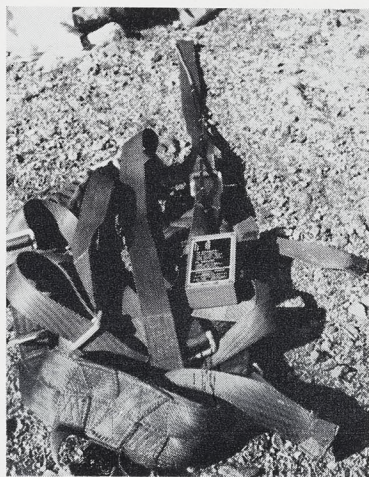
Furthermore, Norair's Air Search Receiver is a unit unto

itself and not a part of any complex instrumentation installation as are other similar devices.

The Norair Air Search Receiver consists of a "black box"

By Aerospace Reporter

receiver—solid state with diode switches—that is left with circuits open while on search flights. There is a small public address-type speaker which can be mounted at any handy location in the cockpit. On the instrument panel in the airplane are two dials—one for signal strength and one for left or right heading. The heart of the system is a two-element automatic alternating sensing antenna that feeds



TRANSMITTER — During Corral Springs search, Norair Air Search Receiver picked up the signal from transmitter, shown here fastened to parachute harness, followed it to point of origin. Entire search test starting at Hawthorne and completed 150 miles away took just 55 minutes.

direction information and signal strength readings.

As you are going toward the downed aircraft, the signal gets steadily stronger. If you should get off course the directional indicator immediately indicates this by commanding a heading change while the signal strength meter registers a weaker reading.

TRANSMITTERS FOR CREWS

Norair crew members of aircraft engaged in missions such as test flights will be equipped

with small commercially available transmitters fastened to the parachute harness. When the chute opens, this activates the transmitter's aerial and power switch and a constant signal is sent over the emergency frequency of 243 mc. Range of this signal varies again depending on terrain. High mountains have a tendency to block it off. If the search vehicle is an aircraft flying at a reasonably high altitude this angle of terrain interference is usually overcome. However, many search and rescue people state that a signal range of 100 yards could mean the difference between rescue and failure should the pilot of the airplane be down in rugged mountains or jungle-type areas.

In finding Mr. Patton, Norair Air Search Receiver picked up the distress call 25 miles away at 15,000 feet altitude.

TWENTY-FIVE MILES

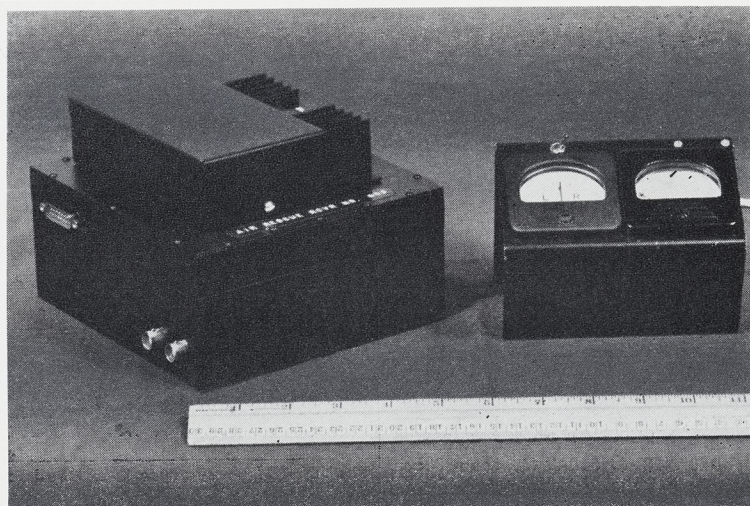
The search pattern Norair personnel use with the Air Search Receiver is the "expanding square" patterned after that used by the Navy wherein the rescue mission flies to the last known position of the lost pilot and airplane. When they reach this point, they execute a 90 degree to the right, proceed on this course for 10 miles then another 90 degree is made and this heading is flown for another 10 miles. Then another 90 degree is made and this heading is flown for 20 miles. Another 90 degree and this heading is followed for 20 miles. After the next 90 degree turn the new heading is followed for 30 miles and this process continues.

All Company airplanes are now being equipped with a Norair Air Search Receiver.

The project, which came under the jurisdiction of T-38/F5 Program Instrumentation Engineering, Dave Seawell, supervisor, was developed by a team headed by C. E. Taylor, lead engineer. Design engineer who refined the present concept from earlier studies was Mr. Patton. Robert Mushet was research assistant. Original proposal for the equipment was handled by Mr. Stanley.

Test flights during development were flown in Company airplanes by Mr. Stanley and Company pilot Ed Hahn.

Design and technical assistance was furnished by Norair's Antenna Lab.



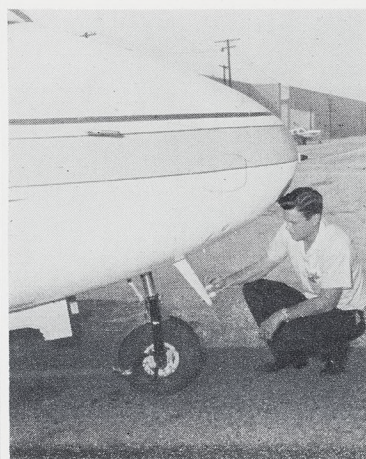
EQUIPMENT — Receiver "black box" occupies approximately one-half cubic foot of space. Can be mounted anywhere in airplane. Instrument panel dials "left and right indicator" and "signal strength meter" are shown at right. Norair Air Search Receiver is a system unto itself, independent of other airplane electrical equipment.



LOST — Before search begins Engineer Patton spreads parachute on the ground simulating position it would have taken in bail out. Corral Springs terrain is rough country. Deep canyons, high mountains have tendency to block distress calls beeped out by emergency transmitter.



ON THE WAY—Max Stanley, chief, Flight Support Operations, at controls, Ed Hahn, Norair pilot, right, and Robert Mushet, research assistant, navigator, proceed on a 290 degree heading out of Mojave to last reported position of "distressed" airplane. Upon arrival at this position they instituted the expanding square search pattern and picked up test distress call on second leg at a distance of 25 miles. Search ended in a tight spiral directly above Mr. Patton's deployed parachute. Norair Air Search Receiver is seen located between pilot seats. Strength and directional meters are seen at top of instrument panel. Antennas are located on nosewheel door.



ANTENNAS — Twin antennas for Norair Air Search Receiver are mounted on Piaggio nosewheel door and point downward in flight. Mr. Mushet checks.



RIDES WANTED

7 a.m. — 3:45 p.m.

AVIATION BLVD. & ARTESIA BLVD., Redondo Beach. Chuck Brandt, ext. 1245. 2
BOLSA & EDWARDS, Huntington Beach. John J. Solema, ext. 1277, TW 3-6429.
STUDEBAKER & STEARNS, Long Beach. Charles H. Lane, ext. 1729, 430-4274. 2
MANCHESTER BLVD. & LINCOLN BLVD., Los Angeles. J. Segner, ext. 1942, OR 0-2564. 2
CULVER BLVD. & CENTINELA, Los Angeles. Juanita Chavez, ext. 4263. EX 1-3437. 2

7:30 a.m. — 4:15 p.m.

VERMONT & 157TH ST., Gardena. Aanes Henken, ext. 675, 4611, DA 9-9195. 3
FLORENCE & VERMONT, Los Angeles. Gary Adams, ext. 691, PL 9-2755. 3

8 a.m. — 4:45 p.m.

BELLFLOWER BLVD. & ROSECRANS, Bellflower. Edna Ely, ext. 1513, 925-4569. 5
BALBOA & SHERMAN WAY, Reseda. Jerry Y. Jensen, ext. 2155. 5
SEPULVEDA BLVD. & CULVER BLVD., Culver City. Peter P. Garriqan, ext. 2425, VE 7-2942. 5
7TH & TEMPLE, Long Beach. Kenny Rogers, ext. 512, 431-7658. 5
WILLOW & SANTA FE AVE., Long Beach. Joy Petuson, ext. 2563, 434-5419. 5
DOWNEY AVE. & IMPERIAL BLVD., Downey. Maurice R. Marchesini, ext. 2155, TO 2-9915. 5
BROOKHURST & CHAPMAN, Garden Grove. Leroy Morse, ext. 2182, LE 9-8888. 5

RIDES OFFERED

8 a.m. — 4:45 p.m.

7TH & TEMPLE, Long Beach. Kenny Rogers, ext. 512, 431-7658. 15
WILLOW & SANTA FE AVE., Long Beach. Joy Petuson, ext. 2563, 434-5419. 15
DOWNEY AVE. & IMPERIAL BLVD., Downey. Maurice R. Marchesini, ext. 2155, TO 2-9915. 15
BROOKHURST & CHAPMAN, Garden Grove. Leroy Morse, ext. 2182, LE 9-8888. 15

BBSF Classified Ads

BBSF classified ad service is provided free of charge to all Northrop Norair personnel.

Ads for agencies, commercial enterprises and private businesses are not accepted.

Deadline is noon Wednesday, one week before publication.

FOR SALE

OLDSMOBILE 88, 1958 h/top, 2-dr., p/steering & brakes, low mileage, \$925. 596-1280. A
RANCH HOME, 3000 sq. ft. on 2/3 acre, Rolling Hills, carpets & drapes, view of harbor & city, \$55,500. 831-9707. A
VOLKSWAGEN sedan, 1962, \$1550. DA 4-7623. A
REFRIGERATOR-freezer comb., G.E., gas range, Wei-Bilt, \$100. 325-3257. A
RANGE, Tappan elec., dual oven, rotisserie, \$300; washer-dryer comb., Lady Kenmore, turbomatic, \$200; refrigerator, G.E., 2-dr. w/swing-out shelves, \$200. DA 4-4845. A
VIOLIN & STAND, adult-size, needs string & bow restrung, \$12; washer, Maytag, wringer-type, \$10. EX 7-2055. A
CHEVROLET, 1957, Bel-Air, 4-dr., h/top, V-8, Turboalide, power steering & brakes, r/h, \$750; VW, 1960 sedan, Blaupunkt radio, luggage rack, \$1145. 293-3752. A
FORD, 1958 2-dr., r/h, motor & trans. o/hailed, new paint, \$700; bicycle, Schwinn Superior, 15 speeds, \$90. 371-6775. A
CHEVROLET, 1955, V-8, stick shift, w/s/w, \$450. 329-6266. A
HOUSE, Hollywood area, 1/2 mile from Mariposa facility, 3-bdrm., 1 & 3/4 bath, 50x147 lot, block wall fenced yard, carpets, drapes, service porch, dining area, \$21,950; mountain cabin, 2-bdrm., Falls-vale, Calif., 40 miles from Big Bear, \$6500; Rambler station wagon, 1961, 4-dr., air cond., \$1500; ski boat & trailer, \$150. 679-8426. A
FORD, 1956 convert., power steering, auto., new tires, brakes & battery, \$450. EM 3-1378. A
CHEVROLET II, Nova, 1962, auto. trans., pwr. steer., bucket seats, r/h, many custom extras, \$1995. 372-2759. A

FOR SALE

HOME, 2-bdrm., carpets, lae, lot, North Torrance, \$16,750; freezer-refrigerator comb., GE, 13.2 cu. ft., \$260; table & 4 chairs, grey formica, \$45; living room suite, 2-pc., \$45. DA 4-1793. A
TERRIERS, Yorkshire, AKC champ. stock, \$100. DA 9-4579. A
AUSTIN HEALEY, 1959, r/h, \$400 for equity, \$70 mo. \$1000 bal. EA 2-0222.
BEDROOM SET, mahogany, chest-on-chest dresser & mirror, dble. bed, 2 night stands, box springs & mattress, \$300. 692-5860. A
BICYCLES, 2, girl's, English racer & Schwinn, \$15 ea. AX 2-6909. A
REFRIGERATOR, Frigidaire w/top freezer, approx. 8-yrs-old, \$39.95. FA 1-1284. A
STOVE, 39" Wedgwood, 2 broilers, center ariddle, \$35. FR 2-1945. A
CHEVROLET IMPALA, 1961 4-dr., h/top, power steering, r/h, \$1950. TE 1-1065.
MOVIE CAMERA, 8-mm, Bell & Howell, elec. eye turret w/indoor filter, \$20. FR 6-3379. A
HUDSON Terraplane, 1937, bus. coupe, \$35; Hudson, 1951 4-dr. sedan, \$50. OR 2-8629. A
TENT, Baker, 9'x14'x6', sleeps 5 adults, \$70; aqua luna regulators, 2, DaAqua-Master, \$45 ea. OS 5-2005 after 5 p.m. A
REFRIGERATOR, gas, Servel, 9 cu. ft., \$25. PL 5-7521. A
FORD, 1951 V-8 stick, woody, recent o/haul, good tires, new paint, spotlight, \$350. ME 3-2990. A
PHOTO ENLARGER takes 35-mm to 620 negs., w/extras, \$45. OS 6-5101. A
CORVAIR Monza, 1963, 102-hp, 4-spd., 6900 miles, \$2145. 679-8433. A
DIVING EQUIP., tank & regulator, \$80 or best offer. DA 3-7166 after 5 p.m. A
SUPER SPORT 409, 1962, 19,000 miles, \$2500. DA 3-2150 after 5 p.m. A
PIANO, Baldwin Acrosonic w/bench, console-type, \$600. LA 5-5641. A
CARPETING, wool, 12'x14', white w/orange, turquoise & yellow w/rubber pad, 6-mo-old, \$200. VE 8-7832 after 5:30 p.m. A
BEDROOM SET, 3-pc., \$25; divan & matching chair, \$30; range, O'Keefe & Merritt, auto., \$150; divided front seat for 1953 Ford, \$5. 374-2433 evenings & weekends. A
MGA, 1960, new tires, fuel pump, Bendix elec. \$1500 or make offer. 837-7391. A
TV, RCA Victor 21", mahogany, console. \$55. 632-4375. A
COMET, 1961 2-dr. deluxe, stick shift, \$1295. OR 0-4761. A
XTAL CALIBRATOR, National NC-303, \$325. AX 3-6673. A
TIRE CHAINS, size 6.00x16, \$5. OS 6-3138. A
PONTIAC, 1961 Tempest station wagon, stick shift, seat belts, \$1405. FR 9-6604. A
DODGE, 1957 Custom Royal, 4-dr. sedan, V-8, r/h, \$395. 789-1698, 451-3264. A
ENGINE, Briaas & Stratton, 3-hp, \$15; bracket for Honda 50, mounts on trailer hitch, \$15. PL 5-4497. A
SURFBOARD, Bina, 8'8", \$80. EA 2-4747 after 5 p.m. A
CHEVROLET, 1953, coupe, stick, r/h, \$200. FR 5-9640. A
MERCURY, 1957 Montclair 4-dr. sedan, power brakes & steering, r/h, new tires, \$595. PL 4-8689. A
MOVIE CAMERA, Revere #88, 8-mm w/normal & telephoto lenses, \$25. FR 4-2915. A
DINETTE SET, 4 chairs & table, plus leaf, chrome & red Formica top, \$25. OR 2-4050. A
CABIN CRUISER, 22' inboard, \$1800 or best offer. LA 1-0664. A
DINING SET, Duncan Phyfe, mahogany table, 5 chairs inc. 1 armchair, \$50. 474-4254. A
FORD, 1960 4-dr. sedan, V-8, auto. trans., r/h, \$950. FR 4-7546. A
GOLF CLUBS, 5 irons, woods & bag, \$30. FR 5-5484. A
VOLKSWAGEN, 1961, r/h, vinyl int. \$1100 or best offer. PL 5-3180. A
ENGINES, 320 cu. in. Lincoln flat head, high comp. heads, all pulleys alum., 2-bbl. carburetion, \$110; Ford, 406 cu. in. \$450; Ford, 272 cu. in., \$100. PL 4-2342. A
FURNITURE, 2 custom Danish modern chairs, \$45 ea.; 3 walnut tables, \$25 ea.; 2 33" ceramic table lamps, \$10 ea. FR 9-4913. A
HOUSE, 2-bdrm., stucco, h/wood floors, tile bath & kitchen, floor furnace, fenced yards, M-1 property, 41'x150' dn., 10 min. from Northrop, \$16,500. OS 5-8965. A
BUICK, Riviera Roadmaster, 1955 orig. owner, full power, new brakes & drums, \$375. FA 1-0020. A
AUSTIN HEALEY Sprite, 1961 orig. owner, low mileage, \$1050 or best offer. 325-5973. A
TV, 21" table model, \$35; posts, 4"x4" 106 a foot. OS 6-3090. A
HOUSE, 2-bdrm., fireplace, carpet, disposal, 2-car garage, sprinklers, large fenced yard, Manhattan Beach, \$6000 down. \$22,500. FR 9-1687. A
CHEVROLET, 1956 station wagon, V-8, automatic, r/h, \$299. DA 3-1509. A

HARD TIMES TO BE THEME FOR SQUARE JETS

The NRC Square Jets announce a hard times party for November 8, from 8 to 11 p.m. at the Hill Rancho.

No square affair, there will be chow, fun and prizes including door prizes, a prize for the best dance and a prize for the worst dance.

Hobo clothes are required.

Ralph Hill will be the caller.

Hill Rancho is at 15701 South Crenshaw, Gardena.

Donations of \$1 will be gratefully received.

BUD WEGNES ROLLS 693

Norair man Bud Wegnes of Product Support rung the bowling accomplishment bell loud and long on a recent night at the Missile.

Rolling on alleys 9 and 10, he put together games of 241, 215, and 237 for a tremendous 693 series.

FOR SALE

PONTIAC, 1956 Catalina, 2-dr. h/top, recent o/haul, new tires, hvv. duty hydromatic, \$450. PL 4-8760 after 5:30 p.m. A
MERCURY, 1954 4-dr. sedan r/h, o/drive, \$175. 324-2992. A
CHEVROLET, 1960 Impala, 4-dr., power steering & brakes, r/h, new tires, \$1600; Ford, Falcon, 1960 station wagon, std. transmission, r/h, \$1045. TO 1-6083, TO 1-6386. A
SKI PANTS, women's black, size 10, \$15; after-ski boots, black suede, size 9, \$8. 837-1541. A
PISTOL, dble-shot cap & ball, .36 cal., recent remake, ammo. available \$25; rifle, 22-cal. Stevens, semi-auto., w/scope, model 85, \$25. DA 9-5364. A

WANTED TO BUY

DRAFTING MACHINE, in good condition. Box 2001. B
PLASTER MIXER, must be in good condition. OR 1-0574. B
RAMBLER, American, 1960 or 1961, stick shift, r/h. 295-5686. B
SHOTGUN, 20 ga. pump, \$50 max. 376-8298. B
BICYCLE, 24" Schwinn, w/2-spd. Bendix hub, bov's. GE 0-9354. B

FREE (to be given away)

RANGE, gas, 4-burner, white. 679-8867. D
PIGEONS, to a good home. DA 7-0304. D

RENTALS OFFERED

APTS., 1-bdrm., new, ultra-modern, pool, patio, Lawndale, from \$120. 326-0474. E
APT., 2-bdrm., carpets, drapes, laundry facility, utilities pd., adults only, near Northrop, \$95 mo. OS 6-8283 after 4 p.m. E
HOUSE, 3-bdrm., furn., dishwasher, built-ins, carpets, gardener, \$200. OR 0-5639. E
APTS., 1, 2, 3-bdrm., deluxe, built-ins, drapes, w/w carpets, \$125 up. OR 8-3367, PL 5-0344. E
APTS., furn., 1-bdrm., \$100 mo.; 2-bdrm. \$150 mo. 372-1447 after 6 p.m. E
APTS., 2-bath, 2-bdrm., built-ins, drapes, garage, near So. Bay shopping center, \$125. FR 9-8337. E
APT., 2-bdrm., newly painted, w/w carpet, drapes, garage, sundeck, \$115 mo. 679-4867 after 6 p.m. E
APTS., Kona Kove, 2-bdrm., lae, patio, 38' pool, built-ins, closed garage, near El Camino College, from \$115. DA 9-5986. E
APT., 3-bdrm., 1 1/2 baths, built-ins, fireplace, carpets & drapes, lae, patio & pvt. garage, near Northrop, children ok, \$165. OS 5-7938. E
APTS., 2-bdrm., carpets & drapes, built-ins, soundproof, insulated, laundry, walk to Northrop, \$115 up. OS 5-6032. E
APT., 1-bdrm., unfurn., carpets & drapes, built-ins, close to Northrop, utilities pd. \$100 mo. FR 2-7686. E
APTS., 1 & 2-bdrm., large, unfurn., disposal, garage, in Hawthorne, children ok, \$95 mo. DA 9-0314. F

FOR SALE OR TRADE

OLDSMOBILE, 1959, Super 88 Holiday, 4-dr. sedan, new w/w tires, power steer. & brakes, r/h, \$1100 or trade for compact. 379-2796. M

Senior Circuit Casaba League for Over-30 Folk

Over the basketball hill just because you are 30?

Not so, says Bill Greene, NRC casaba commissioner, as he announces another Club first, the senior basketball section.

Players to participate must be 30 or older.

A special meeting will be held at the Personnel Activities office tomorrow noon, November 7, to iron out wrinkles.

Certain special rules will be in effect, the emphasis being on

science and skill, states Bill tactfully.

The fast break won't be needed, for instance, and will be eliminated.

Signups will be in order at the meeting. Tom White, Personnel Activities, extension 2784, has additional information.

LEUZINGER HIGH ALUMNI NIGHT SET NEXT WEEK

Leuzinger High School alumni at Norair are advised that the Friday, November 15, Leuzinger-North Torrance football game has been designated alumni night.

All grads are invited to attend and root home the Olympians as they play the final league game of the season.

The Alma Mater varsity has won the first six games of the season so far, 215 points while holding their opponents to 26.

The game will be played at Leuzinger, 8 p.m.

PLAN NOW!

To Attend

NRC ANNUAL HOLIDAY DANCE

At the Ambassador

Saturday, Dec. 7

STAMPS SOUGHT FOR SHUT-IN COLLECTORS

NRC Stamp Club folk have a new project going that is designed to aid patients in local childrens and veterans hospitals, it has been announced.

Foreign and United States commemorative stamps are needed.

Division secretaries and others who receive mail are asked to save such stamps and send them to Dick Pryor, Personnel Activities general supervisor.

When a goodly number of worthwhile issues have been collected, Stamp Club members will make distribution direct to the hospitals.

NORTHROP BLOOD BANK

AMERICAN RED CROSS  NATIONAL BLOOD PROGRAM

I WANT TO GIVE MY BLOOD TO SAVE A LIFE

Please Print

LAST NAME		FIRST NAME		MIDDLE INITIAL	
HOME ADDRESS				HOME TELEPHONE	
CITY				ZONE	AGE
JOB TITLE				DATE OF BIRTH	
ORGN. NO.	SHIFT	EMPLOYEE NO.	EXT.	PLANT	LUNCH HOUR
SIGNATURE					

BALANCE THE BOOKS—Clip and complete this form and return to organization clerks or mail directly to Personnel Activities, Organization 1230, Zone 5. You will be notified when to report for blood donation. Date of next bloodmobile visit will be Tuesday, November 26, 7:30 a.m. to 12:30 p.m. Location is Northrop Recreation Clubhouse, 12917 Cerise. Transportation will be provided. Refreshments will be served. Deadline, November 20.

NORTHROP NORAIR NEWS

Issued biweekly by Norair Division of Northrop Corporation

• Wednesday, November 20, 1963

HAWTHORNE, EDWARDS AFB, PALMDALE

SAN ANTONIO, EL PASO

NRC Christmas Timetable, Red Cadillac for Santa

Northrop Recreation Club yuletide calendar of events as announced by Bernie Doyle, president.

November 30, Saturday

Palmdale-Edwards Holiday Dance . . . From 9 p.m. to 1:30 a.m. . . . Location, Clubhouse, Avenue Q at 31st Street . . . Tickets, \$1 . . . Dale Nichols and his orchestra.

December 7, Saturday

Corporate-wide Annual Holiday Dance . . . Cocktail hour, 8 to 9 p.m., dancing, 9 p.m. to 1:30 a.m. . . . Location, Ambassador Hotel . . . Tickets, \$1.55 a person now available at Personnel Activities offices and NRC Council affiliates . . . Three big ballrooms, three big bands . . . Ambassador Room, Henry Miranda's 6-piece Latin orchestra . . . Boulevard Room, Mickey McMahon's 8-piece orchestra. Juanita Crowley, vocalist . . . Sunset Room, Carroll Wax and his 12-piece orchestra. Jo Ann Greer, vocalist . . . Dress is semi-formal . . . Surprise door prize.

December 15, Sunday

Annual Children's Christmas Party . . . Santa Claus will arrive in a big, red Cadillac at 12 noon and stay until 4 p.m. . . . NRC Clubhouse, 12917 Cerise (one block east of Yukon, one block south of El Segundo . . . Cerise will be blocked off . . . Plenty seating accommodations . . . Continuous entertainment outdoors . . . Coffee for grownups and punch, ice cream, candy, and toys for the youngsters . . . NRC Symphonaires will sing Christmas carols both outside and inside the Clubhouse.

December 19, Thursday

Northrop Adopted Family Program . . . NRC Clubhouse . . . Organizations to forward their Christmas contributions to Clubhouse.

December 20, Friday

Adopted families will be given their gifts at NRC Clubhouse.

December 21, Saturday

Annual Maintenance Dance . . . NRC Clubhouse . . . Leon Guide and his orchestra to furnish the music.

December 21, Saturday

Palmdale-Edwards Annual Children's Christmas Party . . . From 1:30 to 6 p.m. . . . Q Street Clubhouse.

December 21, Saturday

Northrop Space Labs First Annual Huntsville Christmas Party . . . Santa will be on hand with plenty of toys and goodies for the children of the 167 personnel at the facility.

December 28 and 29, Saturday and Sunday

Tenth Annual Northrop Corporation Christmas Bowling Tournament . . . Missile Bowl, 1280 West Redondo Beach Boulevard in Gardena.

December 30, Monday

NRC Annual Christmas Golf Tournament . . . Beginning 7:30 a.m. . . . Candlewood Country Club in Whittier.

December 31, Tuesday

NRC Golf Tournament . . . 7:30 a.m. . . . Los Serranos Country Club in Chino.

NOLAN SETS NEW '64 SAFETY GOAL

GENERAL MANAGER ASKS FOR SWEEPSTAKES BANNER

Dick Nolan, Corporate vice-president and Norair general manager, has issued a call to all personnel to make 1964 the safest work year in the Company's quarter century history.

He asked that all Division employees actively and individually support a day-to-day effort to assure that our silver anniversary will be second to none in safety.

Mr. Nolan stated, "This coming year we will celebrate 25 years of working together as producers of equipment that helps keep our nation strong. Our efforts through the years have been generously rewarded in seeing the products we build score high in quality, effectiveness, and dependability. We have earned many blue ribbons since 1939 and a blue ribbon for safety, especially in this milestone period, belongs with our other banners of excellence."

"Safety is everybody's business."

It is the very essence of employee well-being and it is the solid foundation on which quality workmanship rests.

"What other achievement could tell our story so well and so graphically?"



DICK NOLAN



LEE JOHNSON

"Records show that the aerospace industry is one of the safest industries in the nation and our division helped achieve this. But we want to add something. We want Norair people to be the safest in the industry not only on the job but in the home as well."

"With your help we will attain this team goal in 1964."

Mr. Nolan recalled that Norair with an aggressive management-backed safety program has won over half a hundred top awards.

Included in the honors are a cherished fleet sweepstakes banner for the safest company driving in the aerospace industry for one year.

Eight "Certificates of Safety Achievement" have been awarded the Division by the U.S. Department of Labor. These are given to industrial plants that cut accident rates by 50 per cent, from one year to the next.

Division safety leadership was also recognized when the North-

(Continued on Page 2)

Jones Awarded DSM Honor For Bond Drive

WASHINGTON, D.C.—Thomas V. Jones, Northrop president and chairman, was presented a medal for distinguished service for his work during the past year as a member of the United States Industrial Payroll Savings Committee for United States Savings Bonds.

The medal was presented by Treasury Secretary Douglas Dillon.

Mr. Jones represented the aerospace manufacturing industry on the 28-member volunteer committee which during 1963 was instrumental in signing more than one million new participants in the payroll savings plan.

After the presentation, members of the committee were received at the White House by President Kennedy.

The group, meeting in Washington, was credited with boosting the purchase of bonds through payroll savings to the highest level since World War II and helping to achieve an 11 per cent increase in Series E and H bond sales over 1962.

The committee set its sights for 1964 on enrolling an additional one million payroll bond savers through an expanded program of activities in 27 major industries.

ANNUAL REPORT AVAILABLE TO EMPLOYEES

Northrop Corporation's annual report of its programs and financial progress has just been distributed to shareholders.

Employees who would like to obtain a copy of this report may do so by applying to Personnel offices in the Tooling Building, phone 2412, or in the Engineering and Science Center, phone 1893.

The report contains the annual letter to shareholders of President and Chairman Thomas V. Jones, a report on corporate-wide programs and activities, and corporate financial information.

THANKSGIVING DAY, A HOLIDAY

Turkey time—

Northrop Norair Division facilities will be closed on Thanksgiving Day, Thursday, November 28.

The plant will return to work Friday, November 29 which is a regularly scheduled workday.

Norair Med Flu Clinic Now Underway

Norair Medical group is now conducting the second round in the fall series of influenza vaccination clinics, it has been announced by John B. Clark, director, Industrial Relations.

All who received their first injections in September or October during the first clinic should come in for the second shot to complete their program. Second shot must also be given at the same location as the first shot, Medical states. This is to assure that medical records are complete. Also during the present clinic, yearly boosters will be given.

Clinic schedule:

Today, Wednesday, November 20, Northrop Space Laboratories from 10 to 12 noon. Johnson building, 3 to 5 p.m.

Tomorrow, Thursday, November 21, the Corporate office, 11 to 12 noon and Mariposa dispensary, 3 to 5 p.m.

On Friday, November 22, Palmdale clinic will be held in the morning.

Shots will also be given at the Plant One dispensary on Friday, November 22 from 2 to 6 p.m. and Friday, November 29 from 3 to 5 p.m.

Edwards clinic will be held on December 6 in the afternoon.



HIGH HONOR—Secretary of the Treasury Douglas Dillon presents distinguished service medal to Northrop President and Chairman Thomas V. Jones. (See story.)

Let's Talk About Suggestion Awards

Let's talk about suggestions. Suggestion Awards. Good ideas that pay good money at Norair.

I wonder how many of us know how long suggestion systems have been around in American industry. Most people think that these systems originated during World War II and it is true that suggestions received a

be improved.

One area that seems to be slow on ideas is safety. This does not mean that you should send in a suggestion to report an unsafe condition existing in a given area. Such matters should be reported to your supervisor in a routine way, but if you think you may have an idea which, if put

By John B. Clark

Norair Director, Industrial Relations

big boost at that time due to government-sponsored activity and the drive for greater production. However, the first known suggestion plan actually started in the early 1800's in a Scottish shipyard. In the United States, Yale and Towne Lock Company's plan started in 1880 and paid one dollar for each accepted suggestion.



As evidence of growth, companies with such plans in effect total upwards of 10 million personnel. General Motors Corporation, for example, has nearly 800 people now engaged in working on suggestions submitted by their people and in one year GM paid out nearly \$4 million in awards.

Our Northrop suggestion plan originated as a war baby, the WPD. The postwar present-day plan officially began June 24, 1946, with a three-page announcement being issued with the paychecks. Awards at Northrop for suggestions start at \$10 with a maximum of \$2000.

How much has been paid out in recent years? In the year 1962 on a total of almost 400 accepted suggestions the average award was just under \$50. This is well above the national average which was \$35.85 during the same period.

What ideas do suggestions cover? No limit here as the limit is the one set by the man himself. Without a doubt there is not one method or process used in this Company which cannot

into use, could change a fundamentally unsafe way of doing a job, or if you have a new and better way to guard a machine that you think should be guarded, then send in your idea. Don't limit yourself though. You can help make Northrop a safer place to work and benefit with a cash award at the same time.

It might interest readers to know that we belong to the National Suggestion Plans Association, and our own Cecil Callaway is a director of the Southern California Division of this organization. Cecil ramrods our Northrop suggestion plan and keeps his office in Personnel, Plant One, where you can contact him if you have any questions. You'll note that there are suggestion boxes placed strategically throughout the plant and there are suggestion forms right there for you to use.

To get back to safety a bit—All of us want to work safely and to be able to work in safe surroundings, but the same idea dollar potential applies to safety that applies to other things. There is always a safer way. I would like to see suggestions coming in from every Norair man and woman on this subject. It may well be that only one of them could be used, but that one could be invaluable and may even be the idea that results in saving a life sometime in the future. Look at the job you do each day, look at where you walk, look at the way we now do things and *think* safety. Apply that thinking and send in your suggestions, and if you have a good one it could bring you cash for Christmas.

Safety Blue Ribbon

(Continued from Page 1)

rop Norair News won national and California honors for a highway safe driving feature entitled "Courtesy Equals Safety." The story was later given a large share of credit for launching the "Courtesy is Contagious" campaign that helped stem the State's automobile accident rate.

Lee Johnson, Norair Safety engineer, reveals that an extensive program and one that leaves nothing to chance in the effort to reach the top in industry safety showings, is now in effect throughout the Division.

Mr. Johnson, a 23-year man and a dean in the Southland Safety Engineering fraternity is the man who has headed Northrop's safety office since the Company was founded.

It has been under his guidance that the Company has maintained one of the most successful safety

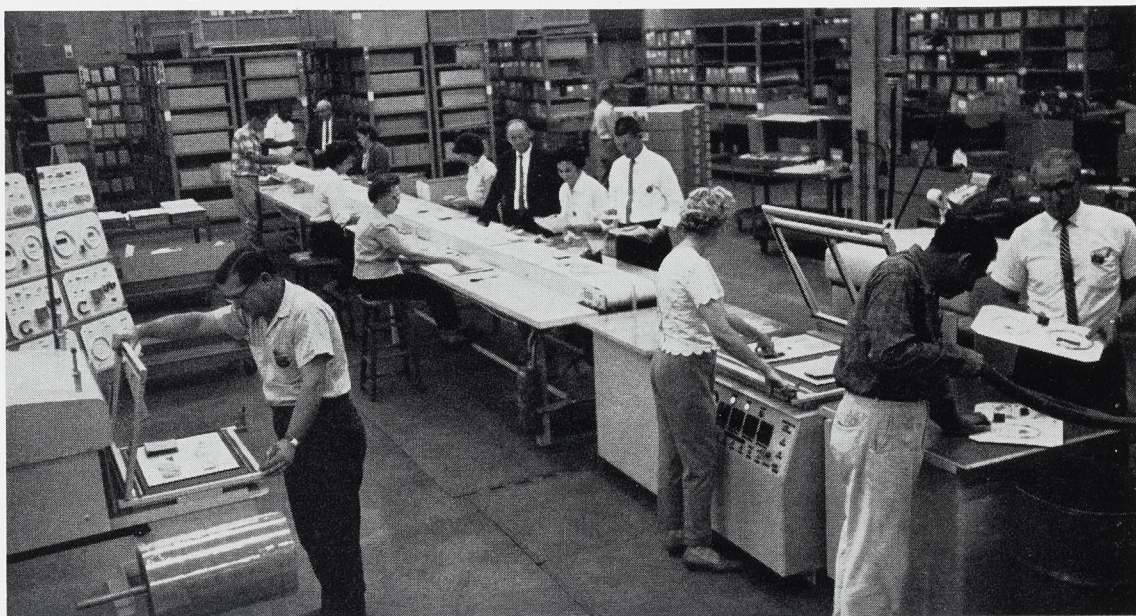
operations in the aerospace industry.

In addition to state and national honors for his work Mr. Johnson received the American Society of Safety Engineers J. Wesley Gebb Memorial Award for original research and perfection of a method of quenching magnesium fires. This commendation came during World War II and shortly after the "Cinderella" metal came into general use in aircraft construction. "Mag" has held no flash fire terrors for workers since that time.

A complete rundown of details of the safety drive and the part plant agencies and individuals will play is scheduled to appear in the next issue of the News.

Safety engineering is a function of the Safety and Fire Prevention branch which in turn operates under the jurisdiction of Plant Services group, P. W. "Bill" Parker, chief.

Vinyl "See Through" Packaging



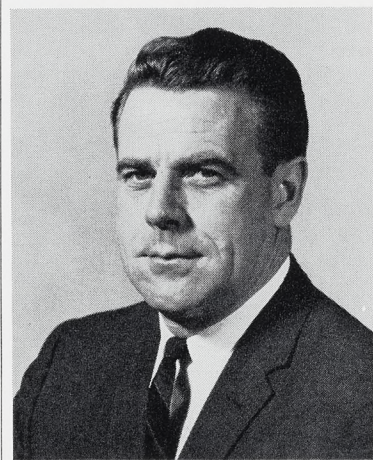
NOTHING TO HIDE — And nothing hidden, is the theme of Mariposa's Shipping, Packing and Crating group, as they activate brand new "under glass" packaging of T-38 and F-5 parts kits. Previously job was done via individual parts wrap with each kit in a paper carton. New way is faster, more efficient and permits visual for possible shortages. Area photo shows parts racks in background. People at endless belt place parts on numbered fibreboards; sealers enclose and seal kits in transparent vinyl film. In foreground, sealing and trimming are from left, Pete Pereshula, Ruby Coddington, and Ray Gautier. At right is R. W. Shearer, foreman. At the belt around the table clockwise, Nellie Miller, Hazel Williams, Fred Lorenz, coordinator; Marion Franklin, Floyd Bower, spares coordinator; Hazel Eades, Hazel Trice, John Reynolds, Quality Control; Josephine Clemens, and Bill Roper, Quality Control. In background is Elmer Sims.

Navy Man to Head Norair Flight Ops

Captain Robert M. Elder, USN ret., has been appointed director of Norair Flight Operations, it has been announced by Welko Gasich, vice-president and assistant general manager-Technical.

The new director, who comes to Northrop following 23 years of commissioned service as a regular United States Navy officer will be responsible for the activities of the Division's experimental test, production acceptance, executive and transport pilots. Also under his jurisdiction will be related flight support operations and aircraft maintenance services.

He will report directly to the office of the vice-president and



CAPTAIN "BOB" ELDER

assistant general manager-Technical.

Captain Elder's most recent post with the Navy was director of Operations, Alameda Naval Air Station in California. During his distinguished career, he commanded two Navy fighter squadrons, an air group and the attack carrier, USS Coral Sea. He has had three tours of duty at the Naval Air Test Center, Patuxent River, Maryland, where his assignments included: head, Carrier Suitability Branch, Flight Test; head, Fighter Branch, Tactical Test Division; assistant director, Service Test Division and director, Flight Test. As a



EVERYTHING IN ITS PLACE—Hazel Trice places electronic parts on kit board prior to sending it down the belt to sealing operation. New packaging system was joint development of Division Packaging Engineering, Quality Control, Logistics, and Shipping, Packing and Crating. J. G. Reid, general supervisor, Traffic, states that the method, in addition to the efficiency factors, scores high in quality assurance, cost avoidance, and customer acceptance.

Navy experimental test pilot, he conducted operational suitability tests, stability and control, and performance flight testing on all types of carrier-based aircraft up to and including the F4H and A3J.

He holds the Navy Cross and the Distinguished Flying Cross. Captain Elder has flown all types of USAF fighter aircraft from the P-40 through the Century Series. He has extensively flown foreign aircraft through the British and French Flight Test Exchange programs.

He was educated at the University of Washington and is a graduate with honors from the Naval Test Pilot School. He is a member of the Society of Experimental Test Pilots.

Captain Elder's hobbies are sailing, golf, and water skiing. He is a native of Milwaukie, Oregon. He and his wife, Irene, have two children; Lauren, 17 and Craig, 14. They reside in Palos Verdes Estates.

CAFETERIAS TO SERVE TURKEY NEXT WEEK

There will be turkey dinners at Norair cafeterias on November 25 and 26, states Freddy Wolfe, general supervisor, Division Food Service.

And with all the fixings. And at all cafeterias, Plants One, Two and Three.

NORTHROP NORAIR NEWS

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CHARLES BRADFORD, Editor

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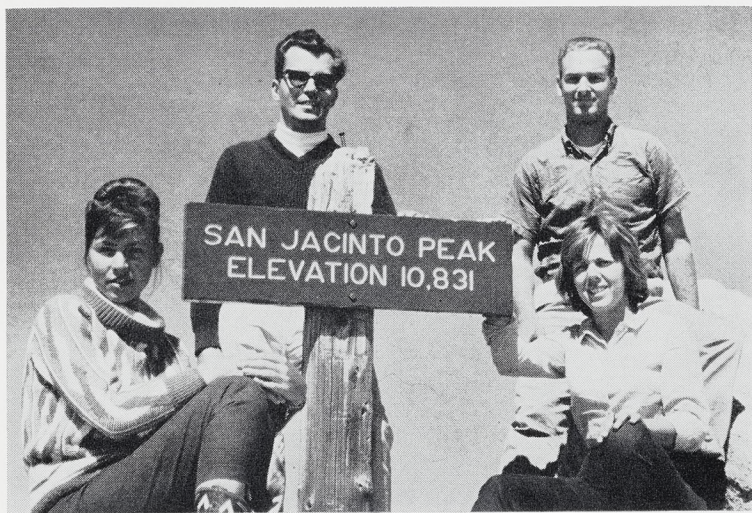
Men of Science



NORTHROP NORAIR RESEARCH COUNCIL—Division consulting and advisory team of leading scientists and educators met in the Engineering and Science Center last week to discuss new aerospace fields and to be briefed on Division programs under way. All-day session was called by Welko Gasich, Norair vice-president and assistant general manager-Technical. In photo above, discussing points on the agenda are from left, Mr. Gasich; Professor Seymour M. Bogdonoff, head, Gas Dynamics Laboratory, Aeronautical Engineering Department, Princeton University; Milt Kuska, Norair deputy assistant general manager-Technical; Dr. Nicholas J. Grant, professor of Metallurgy, Massachusetts Institute of Technology; and Dr. Frank E. Marble, professor of Engineering, Guggenheim Jet Propulsion Center, Cal Tech.



PROJECTS AND CONCEPTS—Kermit Van Every, technical assistant to the vice-president-Technical, briefs Council members on Division science progress. Mr. Kuska is at left. Next are Professor Bogdonoff and Dr. Grant. On Mr. Van Every's right, all from Stanford University are Dr. Nicholas J. Hoff, head, Department of Aeronautical Engineering; Professor Alfred S. Niles, (retired), Aeronautical Engineering; and Dr. Alan T. Waterman, jr., associate director, Systems Techniques Laboratory. In foreground, at end of table are Norair's Dr. C. M. Wong, chief, Structures and Auxiliary Systems group and Dr. Richard Jones, chief, Materials Research group. This is the second full meeting of the Council, the first session being held in March of this year.



SAN JACINTO PEAK—Norair NRC Ski Club members from left, Helga Schroeter, George Kern, commissioner, Steve Landau, and Carol Stahr, pose for do-it-yourself delayed-shutter photo atop San Jacinto Mountain. They were among the first to ride the new aerial tramway that has opened this long secluded wilderness to the public.

Norair Edwards is a Beehive, And T-38 N-5124 is Queen Bee

"You are cleared for takeoff!" This terse okay, from the Edwards control tower crackled in the earphones of Norair test pilots 121 times during October.

Additionally, the Edwards tower cleared Northrop transport planes to land on the great Muroc dry lake runways 167 times. These planes carried 331 passengers.

And there were many bus loads of visitors in to see the X-21s, the F-5 and T-38 aircraft. All of the foregoing was part

of the activity report to Division management on base business for the month.

"Beehive" activity report, Edwards folk say.

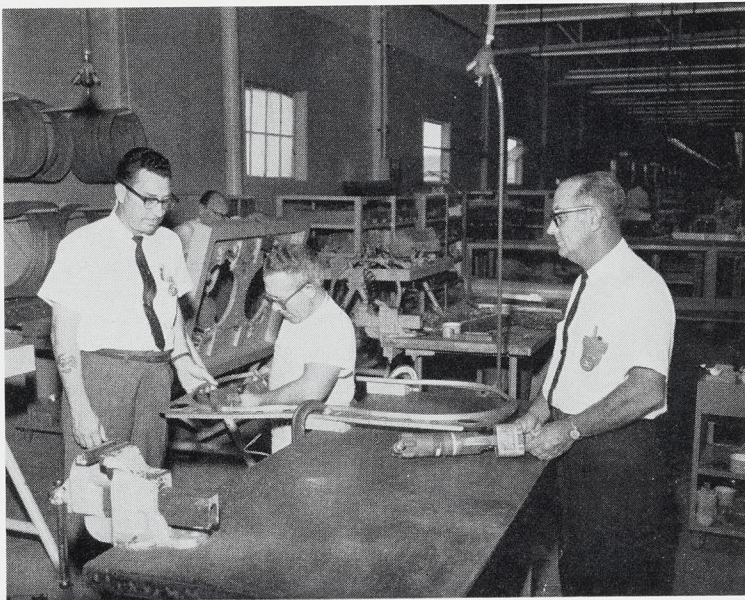
Queen Bee of the fleet is the T-38A, N-5124. This aircraft has 819 flights on her logbook. She has toured the United States and has been to Europe. Jackie Cochran flew this aircraft to 11 world's records.

Nearly all countries can boast that their pilots have taken this Talon aloft. All except the Rus-

sians and other certain curtain ones.

Actual test flight statistics for October as relayed to the News by Lew Nelson, director, Test section:

	Flights	Air Hours
T-38A:		
N-5115	10	6:25
N-5121 (ATC)	29	23:50
N-5124	30	29:55
	69	60:10
F-5A:		
N-6001	24	17:50
N-6003	6	6:10
N-6004	10	9:10
	40	33:10
X-21:		
S/N 408	8	19:50
S/N 410	4	16:45
	12	36:35
Totals	121	129:55



TEAMWORK PAYS OFF—Development of stainless steel piercing unit for alligator squeeze has resulted in time saved on T-38/F-5 boattail formers. Norair men, Barney Taylor, foreman, Boattail section and G. "Ted" Costa, Standard Tool Liaison, foreground, teamed with American Pneumatic Company to achieve cost improvement results. Operating the new tool, center, is A. L. "Shorty" Uyal.

Stainless Piercing Unit Saves Time on Boattail

Shop efficiency scored a bull's-eye recently in the T-38/F-5 Wing and Aft Fuselage area due

FRIED CHICKEN ATOP SAN JACK SKI CLUB FARE

An Alpine climb campout to the peak of Mount San Jacinto was made by the Ski Club the News is advised by Commissioner George Kern.

The weather was clear and mild and the group camped at the Round Valley camp Saturday night where the temperature dropped to 30 degrees. Early Sunday morning after a hearty breakfast, the group climbed San Jacinto peak and enjoyed the view from this daddy of the peninsular range.

Lunch was fried chicken.

After resting for two hours and taking photos of the surrounding area, the group climbed down (5 1/4 miles) to the upper terminus of the new aerial tramway — which was shut down due to a power failure. When tram service was finally resumed at 11 p.m., the waiting group was rewarded with a ride in the full moon down over the jagged rock formations.

The only advice the group would offer to anyone contemplating a similar trip and campout, is to bring an extra pair of warm socks and a good pair of hiking boots.

to combined efforts of Standard Tools, the American Pneumatic Company, and factory supervision in boattail assembly.

Development of a new pneumatic piercing unit to operate with an alligator squeeze, for nutplate locations on stainless 1020 T-38 formers, has resulted in 13 minutes saved per part.

The previous way of doing the job by drilling, encountered high mortality rate with drills, entailed extensive burring, and distorted the flanges.

Team composed of Barney Taylor, Boattail foreman, 5756; G. "Ted" Costa, Standard Tools, and Jack Pettit, American Pneumatic representative joined forces to perfect the fast acting piercing system.

C-O-L INDEX UP, NETS ONE CENT WAGE INCREASE

Northrop hourly rated personnel received a one cent an hour increase effective November 4, it has been announced.

The adjustment was due to an increase of 0.6 points up from the June 1963 index reading in the Bureau of Labor Statistics Cost of Living Index.

Next reading will be taken December 15. Changes resulting from this period will be effective February 3.

Tom Jones to Speak at Next M-C Meeting

All Northrop Management Club members are advised to make their reservations early for the management night dinner to be held December 6 at the Thunderbird Hotel's Crystal Room.

Thomas V. Jones, Company president and chairman, will be the speaker of the evening.

Entertainment will feature the Northrop Symphonaires. Comedian Buddy Lester, a star of stage, screen and television, will provide the lighter side.

There will be door prizes and raffle prizes. Menu will be lobster or top sirloin steak.

BILL PARKER GETS GOLF ACE AT LONG BEACH

Bill Parker, chief, Plant Services, joined one of the most exclusive organizations on earth when his trusty five-wood plunked a ball in the 150-yard seventh at the Virginia Country Club.

The hole-in-one came on a recent Sunday as he toured the course with wife, Susie and golf-

BUY BONDS

ing friends, Mr. and Mrs. Bill Becker.

Added note of interest is that the ball itself was a Northrop "#1".

Added added note of interest, Bill, because of his handicap, scored what amounted to a zero on the 3-par hole which beat Mr. Becker's good birdie.

Tradition at Long Beach is that hole-in-one people buy "cokes" for the gang but as additional luck would have it, Bill had H-I-O insurance and stands to net substantial geedus anyway.

Longtime Northrop man Mac McLarney also scored a hole-in-one recently. See Northrop Norair News, September 25, 1963.



RIDES WANTED

7 a.m. — 3:45 p.m.

PACIFIC BLVD. & GAGE, Florence or Slauson, Bell. Arthur Vetter, ext. 1750, 675.

7:30 a.m. — 4:15 p.m.

PRAIRIE & IMPERIAL, Inglewood, Bonnie Webb, ext. 1581, OR 7-0515.

HERMOSA AVE. & GOULD OR LONG-FELLOW, Hermosa Beach, Carolyn Trump, ext. 1503, 374-9898.

AVE. 43 & NO. FIGUEROA, Los Angeles, R. K. Hoy, ext. 293, CA 5-7515.

8 a.m. — 4:45 p.m.

ARBOR VITAE & EUCALYPTUS OR MAN-CHESTER & EUCALYPTUS, Inglewood, Denise Rosomme, ext. 2586, OR 2-7041.

FOOTHILL & ORO VISTA, Sunland, Clyde Dobbins, ext. 738, 353-4770.

BROOKHURST & ORANGETHORPE, Fullerton, Harmond A. Waxham, jr., ext. 1858, LA 5-4247.

3:45 p.m. — 12:15 a.m.

INGLEWOOD BLVD. & BRADDOCK, Culver City, C. Bellacicco, ext. 200, 398-7417.

RIDES OFFERED

8 a.m. — 4:45 p.m.

FOOTHILL & ORO VISTA, Sunland, Clyde Dobbins, ext. 738, 353-4770.

BROOKHURST & ORANGETHORPE, Fullerton, Harmond A. Waxham, jr., ext. 1858, LA 5-4247.

BBSF Classified Ads

BBSF classified ad service is provided free of charge to all Northrop Norair personnel.

Ads for agencies, commercial enterprises and private businesses are not accepted.

Deadline is noon Wednesday, one week before publication.

FOR SALE

RANCH HOME, 3000 sq. ft. on 2/3 acre. Rollins Hills, carpets & drapes, view of harbor & city. \$55,500. 831-9707.

HOUSE, 3-bdrm., 1 1/2 baths, carpets, drapes, built-ins, dishwasher, covered patio, fully-landscaped, incl. bearing fruit trees, 4 1/2% GI, \$30,500; MGA, 1961, white, red interior, grey top, \$1750. FR 8-4975.

FISHING BOAT, 18', fully equipped, elec. starter, life jackets, bait tank & pump, \$995, \$100 down, terms. DA 7-0304.

WASHING MACHINE, Kenmore auto., \$50. OR 0-7361.

BEER BOX, homemade, draught-type, \$125; refrigerator, beer tap complete, \$89. 371-7878 after 5:30 p.m.

DAVENPORT, provincial, wing back, \$50. 325-3865.

MOVIE CAMERA, Bell & Howell, 16mm, & case, \$90. FR 7-3487.

AUSTIN HEALEY Sprite, 1959, \$795. 370-3961.

WASHER & DRYER, Westinghouse, \$180; Volkswagen parts, front & rear bumper guards, \$15; steering wheel, \$10; seat covers, front & rear, \$10. 933-1964.

CHEVROLET, pickup, 1956, 6-cyl., stick, r/h, long bed, \$695. 370-3933.

STOVE, \$40. OR 1-9682 after 4:30 p.m.

PLYMOUTH, 1957, 9-pass. station wagon, \$450; boat, 14'. Fiberglass, 25-hp, elec. start motor, trailer, \$225; Fiat, 1959 sedan, radio, \$175. EA 2-0646.

FALCON, 1960, auto. trans., r/h, no down, take over \$50 mo. payments. \$695 bal. 374-0015.

WASHING MACHINE, Kenmore, wringer-type, \$35. OR 8-1692.

T-BIRD, 1962, factory air cond., all power, \$3400. OS 5-2772 after 5 p.m.

STOVE, 30". full-size. \$35. 671-1130.

BUICK, Century, 1956, 2-dr. h/top, new trans., battery, ena. has 29,000 miles since o/haul. \$250. 674-3359.

HOUSE, 2-bdrm. & guest house, w/w carpet, mahogany paneling, service porch, extra large dble. garage, 42'x150' lot, fruit trees. \$17,950. OS 6-4920.

WASHER, Whirlpool, \$35. EX 1-2040.

PONTIAC, Catalina, V-8, 1956, 2-dr. h/top, recent o/haul, new tires, Hydramatic. \$450. PL 4-8760 after 5:30 p.m.

STOVE, O'Keefe & Merritt, gas, apt-size. \$50. 831-9589.

FOR SALE

STOVE, apt-size, \$20. 428-2341.

MOTORCYCLE, Harley-Davidson Pacer, 1962, 175-cc, 11 cu. in., w/lqe. dble. saddle & windshield, 2-stroke ena., \$300. PL 6-6874.

POOL TABLES, 2, 7'x44", w/rack, balls & cue sticks, \$70 ea. Box 2101.

HIGH CHAIR, \$3; stroller, \$2. FR 4-8608.

OLDSMOBILE, Super 88, 1954, convert., \$275; range, gas, 36", Roper, \$75. 326-9106.

TRAILER, lqe. o/sized wheels & tires, \$150; range, elec., Friadaire, \$50; Mix-master, Sunbeam, \$25. 371-0101.

CHRYSLER, Newport, 1962, 9 pass., air cond., power windows, brakes, steering, \$3400; bunk beds & mattresses, 2, maple, \$20; automatic washer, Westinghouse, 1-yr-old, \$40; dryer, Friadaire, \$15; rug, beige, 9'x12'. \$20. 670-6258.

OLDSMOBILE 88, 1951, needs paint & valve repairs, \$75; table & 4 chairs, \$30. FR 2-4324.

CORVAIR, Delux 700, 1962 2-dr., stick shift, \$1295. 377-5936.

DINING ROOM SET, maple, table, 42" round w/2 12" leaves, 6 chairs, 4 side plus 2 commadore, \$150; washer & dryer, Kenmore, \$100 for both. OS 6-5453 after 6 p.m. or weekends.

ORGAN, Hammond Chord, w/bench & music, \$375. 645-3873.

WASHER-DRYER, Bendix comb., gas, \$125; reverberation unit, mono. & stereo, \$30. FR 8-3990.

MOTOR SCOOTER, 1962 Vespa Grand Sport, 9-hp, 4-spd., \$275. FR 8-5118.

HOUSE, 1-bdrm., 6-yr-old, stucco, in Lawndale, large enc. yard & carport, \$8900. TE 3-2512.

PIANO, spinet, Wurritzer, maple, full keyboard, \$498. OS 6-8535.

APT., deluxe, 4-unit, 2 & 3-bdrm., 2 baths, forced air, built-ins, carpets, drapes, \$70,000. OS 9-4478.

DAVENPORT & CHAIR, Monterey-style, \$75; drapes, floral design, traverse rod, 9' long, \$40; jointer, 4" & belt & disc sander, 6", Craftsman, \$25 ea. 323-3258.

STOVE, Norge, gas, 4-burner, oven & broiler, \$35 or best offer; chest-of-drawers, 2, \$10 ea. 759-3566.

RANGE, gas, Tappan, \$100; washer, auto., ABC-o-matic, \$40. PL 4-5909.

FORD, Ranch Wagon, 1959, 6. standard trans., radio., \$550; piano, bungalow-style, maple, \$300; Hide-A-Bed, Simmons, king-size, \$75; TV, 19" Hoffman table model, \$15. 674-4037.

HONDA 150, 1962, \$325; Porsche 1600, 1957, rebuilt ena., \$1650. 324-8520.

MICROMETER, Brown & Sharpe 0 to 1", w/lock & ratchet, \$10. PL 4-8142.

LIVING ROOM SET, 2-pc. sectional, Kroehler, \$50; double bed, bookcase headboard, mattress & innerspring, \$50; cornet, super deluxe Getzen, \$75; suit, boy's woolen, size 16, \$15. DA 9-6670.

REFRIGERATOR-FREEZER, Norge, 15 cu. ft., white, r. h. door, \$235. 329-0295 eveninas.

BOAT, 15' Fisherman, cabin, 30-hp Johnson, portable bait tank, trailer, life preservers, \$390. 371-9730.

MERCURY, 1956 2-dr. h/top, r/h, power brakes, auto. shift, \$325. OS 9-1868.

HOUSE, 2-bdrm., h/wood floors, floor furnace, large fenced yard, property 40'x120', Crenshaw dist., \$1200 dn., \$12,000. OR 2-3643.

AMPLIFIER, Gibson, 12" speaker & tremolo, \$150 or best offer. NE 2-2642.

CHEVROLET II, Nova, 1962, auto. trans., r/h, 2-dr. h/top, \$1950. 639-7284.

FREEZER, 7', commercial-type, \$100. OS 5-6081 after 5 p.m.

WELDER, Lincoln, portable, 200 amp, \$450. DA 3-1509.

FURNITURE, club chair, 2 end & coffee tables, 3 lamps, drapes, \$25; writing desk, blonde ash, 54"x23". \$35. OR 7-3788.

HOUSE, stucco, split-level, near San Pascual School, 3-bdrm., 1 1/2 baths, sep. dining room, built-ins, h/wood floors, paved terrace, \$2500 dn., consider second, \$22,500. CL 6-5861.

CHEVROLET, 1957 Tudor, r/h, automatic, new paint, \$425. FR 5-5139.

DRUM SET, Slingerland, \$175; shoe skates, boy's, roller, w/carrying case, size 5, \$10; size 6, \$15. OR 7-6348.

CEMETERY LOTS, 3, in Inglewood Cemetery, valued at \$1350, \$650 inc. transfer fees. NE 2-6142.

FREEZER, 13 cu. ft., \$75; TV, 21", \$50; tape recorder, \$95; bar-b-q, \$7.50; clarinet, \$35; flute, \$20. FR 5-3359.

BICYCLE, girl's, 26" Schwinn, \$12. PL 6-7337.

WASHER, Friadaire deluxe, 1962 model \$150; bar-b-q table & 2 benches, 6' \$15; rug & pad, 9'x12'. \$30; lawnmower 22". rotary blade, \$45. 674-0120.

FORD, 1962, Econoline pickup, w/camper, custom cab, r/h, new 6-ply tires. \$1950. DA 5-2918.

DODGE, 1957, Custom Royal, 1-owner, 4-dr. sedan, V-8, r/h, \$395. 451-3264 or 789-1698.

MOVIE CAMERA 8mm, Bell & Howell, elec. eye, w/3 fast f/1.8 lenses, speeds 10-40. \$69.95. 398-7417.

TABLE SAW, 8" Craftsman, fully equipped, \$95; TV, 21" Raytheon, console, \$50. OS 6-3636.

SYMPHONAIRES PREPARE FOR YULE PROGRAMS

The NRC Symphonaires mixed chorus, Gene Boggess, commissioner, are putting the final touches on their Christmas program with first performance of the season scheduled for December 6 at the Hawthorne Intermediate School. This will take the form of the Club's annual festival with a variety of Christmas music, both sacred and secular, to be presented.

On the same evening, the Club will also sing at the Northrop Management Club dinner at the Thunderbird Hotel.

A week later the Symphonaires will present a program at the Grace Methodist Church, Gordon Reeder, a former Symphonaire directing.

Two days later they will entertain at the Northrop Recreation Club December dinner and one week later they will appear at the First Methodist Church of Inglewood.

FOR SALE

IRONER, GE auto., \$100 or best offer. FR 9-6824 after 6 p.m.

WIG, golden red, human hair, w/box & stand, \$80; beige dress, size 10, Dorothy O'Hara, \$20. OR 8-0766.

LOT, 1/2-acre in Westfield area, w/panoramic view of L.A. basin, \$20,000. DA 6-2453.

SKI BOAT, w/trailer, 16' inboard, many extras incl., \$450. FA 8-4188 after 5:30 p.m.

SKI BOAT, 14', 40-hp Mercury elect. start, trailer, water skis, ski line & ski belt, \$550. DA 9-7455.

VACUUM CLEANER, Westinghouse, canister-type, all attachments, w/11 toss-away bags, \$20. FR 6-6543.

OLDSMOBILE 88 1958 convert., p/steering & brakes, r/h, \$895. 679-5913.

DINING ROOM SET, w/6 chairs, 2 w/arms, buffet, blonde, modern, \$35. OR 0-8453.

CHEVROLET, 1953 coupe, stick shift, r/h, \$195. FR 5-9640.

BUICK 8, 1953, \$150 or best offer. 225-6342 after 6 p.m.

CORVAIR, 1960 deluxe 700 series, r/h, w/w, floor shift. \$900. OR 1-4845.

GUITARS, Martin Spanish w/case, \$45; Gibson 3/4-size elec. w/case & amp., \$125; Shopsmith, w/over \$50 in accessories, \$285; radio, Emerson FM, table-model, \$19. PL 9-2755.

CORVAIR, 1960, r/h, \$725. 371-6923 after 6 p.m.

HOUSE TRAILER, 15', camping-type, sleeps 5, ice box, butane stove & lights, water tank, hookup for ext. lights & water, \$550. Box 2102.

WANTED TO BUY

BED, twin-size w/good mattress & springs. 374-3283 after 5 p.m.

HOME, 3-bdrm., in Palos Verdes area w/view & small yard. Box 2103.

ROLLAWAY BED, single, OS 9-6982.

DACHSHUND, miniature female, 3 mos. or younger w/papers. Box 2104.

FOR SALE OR TRADE

COLT, 22-cal. Scout, holster & shell belt, trade for shotgun, 12 or 20 ga. FA 8-5365.

RENTALS OFFERED

APTS., 1-bdrm., new, ultra-modern, pool, patio. Lawndale, from \$120. 326-0474.

APT., 2-bdrm., built-in stove, carpets, drapes, garage, washer & dryer furn., in El Seauda, \$135 mo. EA 2-3958.

APT., 2-bdrm., w/w carpet, drapes, built-ins, disposal, garage, \$100. OS 6-2501.

HOUSE, 1-bdrm., \$65 mo. OS 6-5565.

APT., 2-bdrm., w/w carpet, drapes, built-ins, 1/2 mile from Northrop, \$105 mo. OS 6-8816.

DUPLEX, flat, unfurn., 1-bdrm., aarb. disp., serv. porch, adults, no pets, West Los Angeles, \$90 mo. GR 7-0618.

HOUSE 3-bdrm., 1 1/2 baths, built-ins, \$150 mo. 374-2433 eveninas & weekends.

DUPLEX, 2 miles from Norair, 1-bdrm., unfurn., garage, disposal, \$80 mo. OR 4-0755.

APTS., 1-bdrm., unfurn., stove, refrigerator & garage, \$80 mo. 645-1621.

APTS., 2-bdrm., unfurn., carpet, drapes, built-ins, pool, large patio, closed garage, close to South Bay center & San Diego Fwy., from \$115 mo. DA 3-1946 after 4 p.m.



SCOUT LEADER FOR 1964—Thomas L. McCarthy, Norair manager, Administration, (sitting), and new chairman of the Boy Scout Centinela District for 1964, is introduced by master of ceremonies Georg Babbe at the district's annual recognition and installation meeting. In his acceptance speech before more than 500 people at the Airport Marina in Westchester, Mr. McCarthy recapped progress made in 1963 and, in looking to 1964, spoke of the challenges "to carry the scouting story to more people, to raise more funds and find more boys on which to spend them." The Centinela District encompasses Hawthorne, Inglewood, Lawndale and Westchester. At left is Mrs. McCarthy.



THEY HAD A PARTY—Norair Engineering Laboratories, Royal Jackman, chief, presented NRC-sponsored luau for one and all at the Alondra Club. Photo shows program stalwarts Kenny Payne, Connie Amatore and Jay Wallace, all from Laboratory Operations. They planned, worked with NRC, sold tickets. Entertainment? Yes, professional plus hula contest with winners, Pat Davis and Kenny.

Entries Open for NRC's Annual Holiday Bowling

The NRC bowling event of the year, the annual Christmas tournament will take place on December 28 and 29 at the Missile Bowl, it has been announced.

Entries opened November 7 with a closing deadline of December 6. Entry forms should be turned in to Personnel Acti-

DUPLEX, 1-story, children & pets ok, range & refrigerator avail., fenced yard, on Rosecrans near Aviation, \$70 mo. 679-8867.

SLEEPING ROOM, pvt. entrance, bath & shower, utilities paid, near transportation & shopping. \$45 mo. OS 6-7328.

APTS., 2-bdrm., pool, patio, all extras, 1-mo. free rent, near El Camino College, from \$115. DA 9-5986 after 4:30 p.m.

HOUSE, 2-bdrm., \$110 mo.; apt., 1-bdrm., unfurn., \$75 mo.; furn., \$80 & \$90 mo.; disposal, carport, sound insulated, near Northrop. OS 5-9695.

APT., 2-bdrm., unfurn., w/w carpets, insulated, garage avail., adults only, \$95 mo. 433-5512.

PERSONALS

I WISH to thank my many friends & associates for their floral tributes & messages of sympathy prompted by the death of my mother, Mrs. Lala B. Crews. PAUL H. CREWS.

vities. This is a Corporate affair with all elements of the company taking part. Fee for each event is \$2.50 a person, \$1.50 which pays for the alley with \$1 to the prize fund.

The tournament is open to all Northrop people and their families and members of the Air Force office as well. Also, representatives from other companies on site here are invited to participate.

There are no entry limitations on doubles providing there is a different partner each time. Singles may only enter once.

There will be trophies, but of course, with honors going to overall high game series scratch for men and women and high handicap game, men and women. Scratch scores will have preference over handicap game, it is stated.

The tourney is divided into A and B divisions with a total of 18 separate categories.

NORTHROP NORAIR NEWS

Issued biweekly by Norair Division of Northrop Corporation

• Wednesday, December 4, 1963

HAWTHORNE, EDWARDS AFB, PALMDALE

SAN ANTONIO, EL PASO

To Renew Our Devotion . . .

The tragedy that has befallen the Nation touches every one of us individually.

At Northrop we believe that our best tribute to President Kennedy is a commitment to advance to the best of our abilities those National objectives entrusted to us. This is a commitment not for a day or thirty days, but for as long as the need may continue.

On behalf of all of us at Northrop, I have wired President Lyndon B. Johnson pledging to him our united and whole hearted support in this difficult time.

Mrs. Jones and I share with you and your families the grief we all feel over the events of the past days. Our response is to renew our devotion to those principles of good citizenship and our respect for constituted authority and law that have been the foundation of our country from the beginning. Only in this way can we begin to recover from the affront that has been given to our concept of the American ideal.

*Thomas V. Jones
President and Chairman
Northrop Corporation*

A Norair First



TWENTY-YEAR TEAM—Mr. and Mrs. Philip Loth wrote a headline last week as the first Division man and wife team to receive diamond studded 20-year pins on the same day. Mr. Nolan, who made pin presentation, congratulated them on their years of service. Philip is Manufacturing Control supervisor and Bertha is area dispatcher, AOC. For pin presentation photo see page two.

HIGH PRAISE FOR F-5 MOBILE UNIT PROGRAM

TRAINERS DELIVERED EXACTLY ON SCHEDULE

The first set of F-5 fighter mobile training units was delivered to the Air Force last week, November 29, exactly on schedule and five months preceding the delivery of the first operational airplanes.

The work, which was completed on budget, was awarded by the Air Force to Norair following an industry competition with other mobile training unit manufacturers taking part.

The "MTU" trainers are located at Williams Air Force Base, Arizona and will be used for training of Tactical Air Command maintenance personnel, M A P country (Military Assistance Program) instructor pilots and maintenance instructors. Also and importantly, the first cadre increments of MAP maintenance personnel will receive their technical in-

doctrination and training with the new units. These are the men who will per-



BOB LLOYD

form the initial maintenance on the F-5 when it is received in their respective countries. Stated Bob Lloyd, vice-presi-

dent and assistant general manager-Operations. "The on-schedule delivery of the F-5 mobile training units was of extreme importance to the entire F-5 MAP program. This means that Air Force and Military Assistance Program pilots and maintenance personnel will be fully indoctrinated and proficient in the F-5 systems before the first airplane arrives for duty. No time will be lost due to training lags in putting the airplanes in the air and keeping them there. It assures that Northrop's fighter ambassador to the far corners of the world will get off to an exceedingly fine start.

"On behalf of the entire Division, I wish to compliment all personnel who had a hand in this exceptional job so well done."

Harry Blocher, supervisor, (Continued on Page 3)

"Safety is Everybody's Business" is Theme for Norair's Blue Ribbon Drive

With Corporate Vice-president and Norair General Manager Dick Nolan's call for a blue ribbon safety sweepstakes banner in '64, the entire force of Division personnel are even now in the final weeks of 1963 taking that extra constructive look at safety conditions around them. Not only at work but in the home and on the highway as well.

The catch phrase "Safety is Everybody's Business" has become a byword overnight.

As indicated in the last issue of the News, details of the master plan to supplement and be in support of regular safety routine would be forthcoming.

Norair Plant Services' Safety and Fire Prevention branch, has furnished an outline of specifics. The plan appropriately called "Seven Keys to Safety" relies heavily on the efforts of Mr. and Mrs. Norair Division with important contributions due from all levels of personnel.

Safety and Fire Prevention branch, Plant Services group is a part of Norair Industrial Relations section, John B. Clark, director. Industrial Relations which stems from the Norair Administration department, Thomas L. McCarthy, manager, has overall operational safety responsibility for the Division.

SAFETY KEY #1

Functions of the plan as explained by Lee Johnson, Division

chief safety engineer, are divided into seven distinct areas of action.

Engineering and Planning—This initial function is the preventive phase of safety—to shut the door on hazard before it starts to roam.

Already an important element in the plant safety program, Safety Engineering and Planning is to be broadened and targeted to both the short and long range aspects. It will be an active to-the-point program wherein plant safety experts tie in with agencies responsible for facilities planning, engineering and construction with the goal that safety requirements be fully incorporated in the concept stage, followed through during construction, and

inspected for compliance after the installation is complete.

This could apply to such undertakings as an entire factory, a bank of machinery, or a series of hot dip tanks.

The Engineering and Planning function is both a look into the future and an overall continuous review and assessment of how our performance measures up to expectations. Experience gained from day to day becomes compound safety interest applied to management safe work tools of tomorrow, next month, next year.

SAFETY KEY #2

Inspection Program—Here the present Safeguard Survey (Continued on Page 2)

MANAGEMENT COMMENTS

"Safety is truly everybody's business. It ranks equally with good workmanship, schedules, and cost improvement. The Manufacturing department is 100 per cent behind the blue ribbon drive for 1964."

Jack Mannion, manager, Manufacturing

"A preventive safety program is an important tool in building quality products. Norair builds quality products. We will build quality safety in 1964. The best in industry is our goal."

Bob Catlin, manager, Quality Control

"Safety sweepstakes is a personal challenge to every member of the Norair team. We build the safest airplane in the Air Force, the T-38. Now we will build the safest work record in aerospace in 1964."

John Breneman, manager, Night Operations

A Prince in the House of Osterberg

This is a story of a Prince. A Prince in the House of Osterberg. What's that, you say? This question would probably not be asked by any old-time Northrop man or woman who remembers the "House of Osterberg" as being one of our proudest boasts in the early days of the Company.

In reviewing a few early editions of the Northrop News a few days ago I came upon the issue of December 15, 1942. A News story carried a photograph of five stalwart gentlemen with the caption, "Five Osterbergs on Northrop Production Line." Surely, the

them today, as we did in 1942 as a group of loyal and conscientious members of our personnel who have contributed more than their share in making Northrop "a family affair."

This all leads me up to the main purpose of this article and that is the story of the Prince in the family, young Gary, now all of 21 years of age. Gary is fast becoming an important local television personality. He is the son of Bert Osterberg in the Work Analysis group and I need not tell you that dad is very proud of his boy. Perhaps you

By John B. Clark

Norair Director, Industrial Relations

Osterbergs in those days were considered among the "first families of Northrop." They included father David, then about 51 years of age who was working



in our tool cribs; Bert, a son, in the Production Engineering department; another son Curtis, in tool crib; brother of David, Axel Osterberg, who worked in the Boeing Nacelle Final Assembly department; and yet another, Walter Osterberg (twin of Curtis) who was a member of our Jig Construction department. In addition to the Osterbergs in the picture, there were three others; namely, Anne, wife of Curt; Cliff, brother of Bert, Walt and Curt; and George, son of Axel, making a total of eight Osterbergs working with Northrop at the same time.

Today the Osterberg clan working with Northrop Norair includes brothers Walter and Bert and Bert's wife Cecil who is in the Personnel group. Dad retired several years ago.

Because of the almost continuous service of the Osterbergs covering more than 20 years, it is fitting and proper that we salute

have seen young Gary who has become practically a permanent star of the current television program known as "Addograms." Addograms is one of the newer programs that is growing in popularity. It is a daily feature at 7:30 p.m., Monday through Friday, on Channel 5, KTLA. The program, emceed by the popular Jack Barry, is a modern version of the old "spelling bee" in that the contestants with the cue of one, two, or three letters of a word are required to correctly spell a longer word from that root. Gary has consistently come out on top, vanquishing all fellow contestants and is richly rewarded by his sponsor with such bounty as U. S. Savings Bonds, clothing, household furnishings, vacation trips, and you name it.

But, Gary's story does not begin and end with the Addograms program. Let it be said to his credit that he is a high ranking student at UCLA (now a senior) and is captain of the University's soccer team. I well recall the Osterberg boys, excepting dad and uncle Axel, when they were members of the Northrop soccer team back in the early '40s; so, such athletic prowess comes naturally to young Gary.

I can recommend Addograms as an entertaining and education-



GRADUATION DAY—Supervision of Product Support department, Frank Mathes, manager, pose for photo with Bob Lloyd, vice-president and assistant general manager—Operations, following completion of series of seminars in "Management Principles." The group, of key importance to the Company's T-38/F-5 programs, reviewed in detail management techniques and processes in the interest of tops in product support at home and abroad. Mr. Lloyd personally presented "diplomas" during the ceremony. From left, seated, Gabe Sady, Burton Pierce, Woodrow Barron, Lillian Kramer, Mr. Lloyd, Jim Anthony, Edward Foord, and Donald Paap. Standing from left are Thomas Lancaster, Harry Blocher, Paul Goff, Dale Huss, Bill Hoffman, Bill Putnam, Wiley Clark, Jack Nation, James Steele, and Verne Reynolds, instructor, Education and Training.

Seven Keys to Safety

(Continued from Page 1)

program is being broadened so that plant safety officials will not only inspect for major hazards but will keenly scrutinize such additional items as housekeeping, safety equipment, ventilation, handling of toxic materials, control of flammables, and handling of explosives, to name a few.

Safety and Fire Prevention branch has newly designed a check list similar to that used by pilots to safe check an airplane before takeoff. This will become a written report with information copies going to supervision and other key persons with written replies in order as to correc-

al program and suggest that you tune your dial to see and hear Gary in action; and, oh, yes, Bert further advises that Gary is in love, the object of his affection being Miss Christa Aab who is, of course, a beautiful Swedish blonde and worthy of an Osterberg. What with his valuable prizes to date, Gary has a good start on house furnishings so essential to newlyweds.

Turn your dial to Channel 5 and see for yourself an Osterberg in action.

tive measures taken on hazardous conditions found. This will be a continuing program with results reflected in emergency cards used in the Plant Protection Control Center. Tabulation of data will help form the basis for safety analyses in reporting to management.

SAFETY KEY #3

Accident Administration and Investigation—Accident rates are compiled of statistics with each statistic representing pain or misery on the part of a human being. And there is the loss of time to the individual, not forgetting his importance as a worker on vital defense materiel Norair builds for the United States.

Accident Administration and Investigation will work to establish a factual basis for the disposition of compensation cases in the interest of both the person injured and the Company.

So far in fiscal year 1964, workman's compensation cases have been minor. That accidents are kept to an absolute minimum, idealistically zero, and the elimination of this pain and misery is the actual objective of Mr. Nolan's challenge for a sweepstakes record this coming year. However when accidents do happen, Norair intends that adequate machinery always exists, and is used, for proper care and compensation.

An added step in the plan is the utilization of Employee Relations as a monitoring agency to ensure that if a person is harmed on the job, he will receive the utmost in care and consideration from time of injury to time back to work.

Data in compensation cases will be analyzed and included in safety performance reports to management.

SAFETY KEY #4

Information Analysis, Reporting and Follow-up—One of the first actions undertaken in the new safety plan was the issuance each month of a safety report to top management compiled by the Safety and Fire Prevention branch.

This document charts by department and nature, accidents occurring during the previous 30 days. Also weekly and monthly statistical reports are being submitted. Also coming up are in-depth Safety analyses for the supervisors. In this manner, each

Norair organization will be able to determine its safety standing in relation to its own past performance and in relation to other organizations in the plant.

SAFETY KEY #5

Procedural Manual—Safety and Fire Prevention branch will issue a new safety procedural manual which will rank in authority with other similar documents such as Norair Security manual. It will be in a distinctive binder with bulletins and standard practice procedures issued through regular Business Systems channels.

Control of the new procedural manual will be a responsibility of Safety and Fire Prevention branch.

SAFETY KEY #6

General Safety Instructions for all personnel—The "Northrop Safety Manual" which is issued to all personnel at times of employment is part of the '64 blue ribbon safety plan. This booklet will be revised and updated and republished for inclusion in the regular "Working with Northrop" manual, a new issue of which is planned after the first of the year.

SAFETY KEY #7

Safety Committees—An institution at Norair as old as the Company, is Norair's Safety committees. They are the right arm of both management and the Safety staff and through regular meetings provide basic and specific information on hazardous conditions wherever they exist in shops, offices, and in the field.

A safety state-of-the-art program of information, education and coordination, is being implemented to assure that safety committee membership, over 275 strong, continue their vital contributions to plant well-being on a 24-hour and day-to-day basis.

Their Twenty-year Anniversary



TWENTY-YEAR PIN FOLK—Corporate Vice-president and Norair General Manager Dick Nolan presents diamond pins to Division personnel who turned 20 years service this month. Shown with Mr. Nolan, head of table, from left are seated, Lillian L. Manning, Irene S. Gordy, Marie B. Murnane, Bertha V. Loth, Evelyn Trosi, Blanche Lowell, and Jean Deporter. Standing, from left, John Hathaway, Peter Williams, Samuel Shultz, Emil Nelson, Robert Brumpton, Jack Fisher, Karl Kiland, Gerald Rector, Herbert Johnson, Philip Loth, and Otis Adams. Photo was taken in the Board of Directors room, Plant Four. Mr. Nolan, a 24-year man himself and with third most seniority in the Company, took the opportunity to talk about old times and new times and hold question and answer session on Division plans and progress.

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CHARLES BRADFORD, Editor

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MTU's SENT TO WILLIAMS, LLOYD PRAISES TEAM

(Continued from Page 1)

Training and Training Equipment, Product Support, states that there are 12 systems trainers including 20 panels representing the F-5A and B aircraft. The trainers contain the following major systems:

- Utility Hydraulics
- Flight Controls
- Canopy and Ejection Seats
- Mechanical Accessories
- Fuel (see photo, this page)
- Electrical
- Instrument
- Compass
- Electronic Navigation
- Communication
- Armament (see photo, this page)
- Drag Chute
- MTU Support Equipment Group

An engine controls trainer and a jet engine equipment group will be furnished the Air Force by the F-5 (J-85-13) engine manufacturer, General Electric, the News was told.

In addition to these trainers, Norair is supplying 600 technical training transparencies which will be used in the classroom portion of the training program.

Delivering a set of trainers five months prior to the delivery of the flying aircraft required intricate program management and control. Aircraft systems design

data and production parts had to be obtained early. Systems changes resulting from aircraft development necessitated extensive liaison between Product Support engineers and Advanced Production personnel, this to assure technical accuracy in the trainers.

Advanced Production, Rex Thornhill, superintendent, developed special controls to assure the availability of components, both aircraft and MTU, in meeting schedule and budget commitments.

Engineering for the second, third and fourth sets of trainers and transparencies is now being released. These sets will be delivered to the first three MAP countries to receive the F-5A/B aircraft.

Product Support personnel are ticketed to conduct a training program at Williams AFB during January 1964. This will be a two-phase program. Phase I will cover training in differences between the T-38 and the F-5 for approximately 80 U.S. Air Force maintenance and instructor personnel.

Phase II will cover training for 27 Air Training Command instructors on the MTU and transparencies. This team will then conduct all other Air Force and MAP country instructor training plus training the first contingent of aircraft maintenance technicians for each country.

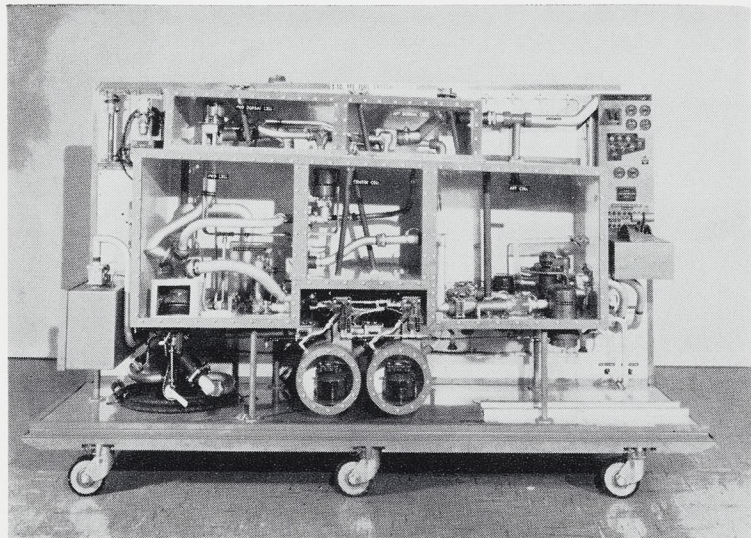
No Training Lag for F-5 Fighter



CONTRACTS, DESIGN, PLANNING, AND REPRESENTATION — Program management wrote record, helped get F-5 training off to a "flying" start. Customer, with units five months ahead of first operational airplane delivery, will be ready and waiting with system know-how. From left, W. R. Dukeman and H. E. Witherwax, training engineers; J. W. Alexander, Contract Administration; Carl Doumont, Manufacturing Program Planning; J. P. Steed, MTU Design group leader; Gaylord Anderson, chief, Field Service and Training; L. D. Heilman, Q. H. Cunningham, B. W. Powell, and R. W. Vogel, training engineers; D. F. Hollands, F-5 tech rep; and D. R. Marston, training engineer. Stated Mr. Lloyd, "As a result of this exceptional job so well done . . . there will be no time lag in getting airplanes in the air and keeping them there."



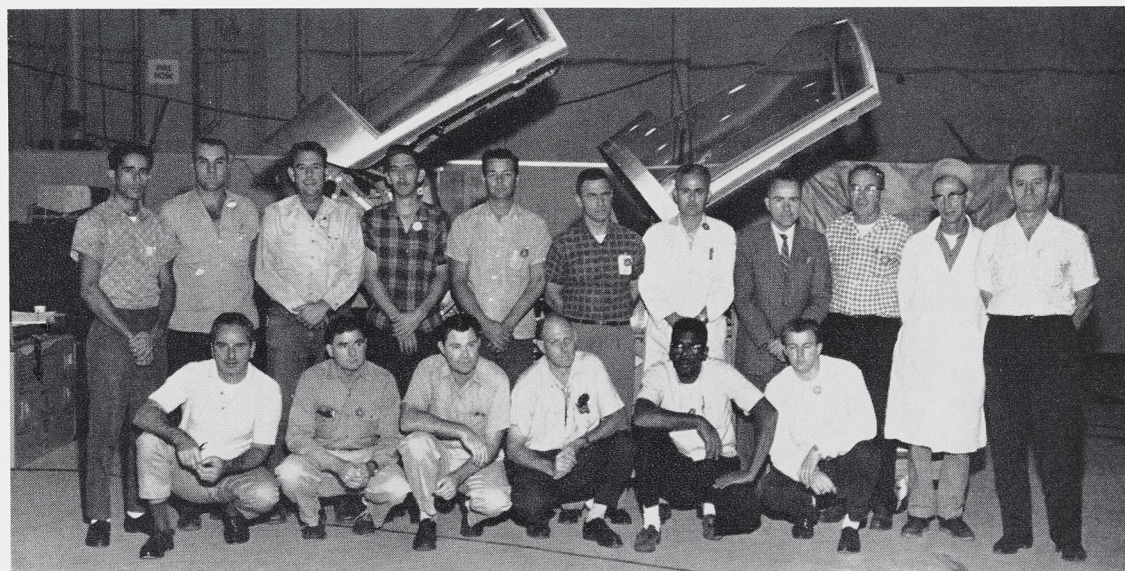
THE ARMAMENT SYSTEM—MTU F-5 armament system is checked by Major Conger and Major Johnson. Photo serves to illustrate the advanced state-of-the-art as applied to the units. Unique feature at top is "push button" display of the F-5's weapon combinations. Trainees can push buttons and load the "airplane" with any combination of offensive stores, pull the trigger and check electronics for action and results.



THE FUEL SYSTEM UNIT—Here is photograph of unit that will be used to train both Air Force and MAP country personnel in design and operation of the fuel system. Note complete reproduction of fuel cells, pumps, gauges, throttles, and warning lights.



CUSTOMER TEAM—Air Force men whose support and coordination and constant readiness to serve helped write the F-5 mobile training unit record, stop for photo during Engineering Inspection session held one week before delivery. They are from left, front, TSgt. W. E. Andrews, MSgt. F. G. Buesking, and TSgt. R. L. Belcher, ATC; F. D. Palmer, ASD; Major J. L. Carter, MAAMA; and SSgt. R. H. Arrowood, ATC. Standing, from left all from ATC are TSgt. J. A. Hedger, TSgt. C. W. Smith, SMSgt. H. K. Camp, TSgt. V. J. Leonard, TSgt. R. F. Katt, Captain C. W. Siess, Majors T. W. Johnson, and W. E. Conger. MTUs will be stationed at Williams Air Force Base, Arizona.



MTU MEN FROM MANUFACTURING—These men did yeoman service in producing equipment that was per print, exceptional in quality and workmanship, and of course, on time all the time. From left, front, Bill Swart, W. F. Sherrill, R. G. Smith, Les Hepburn, Bruce Crain, and Steve Hooton. From left, standing, Ralph Lopez, G. J. Title, G. W. Malone, J. L. Hammock, J. F. Lee, Jay Rayner, Wally Figueras, MTU program leadman; E. C. Mensak, Advanced Production foreman; Herb Jones, Jim Wilson, and Max Bigham. See story for Mr. Lloyd's congratulations.



RIDES WANTED

7 a.m. — 3:45 p.m.

BOLSA AVE. & EDWARDS, Huntington Beach. John Solema, ext. 1277. TW 3-6429.

8 a.m. — 4:45 p.m.

HAWTHORNE & 137TH, Hawthorne. Margaret McKenzie, ext. 1328.

BBSF Classified Ads

BBSF classified ad service is provided free of charge to all Northrop Norair personnel.

Ads for agencies, commercial enterprises and private businesses are not accepted.

Deadline is noon Wednesday, one week before publication.

FOR SALE

RUG, w/pad, beige, wool, 12'x18', 1-yr-old, \$100. GR 7-0618.

BREAKFAST SET, ext. table & 4 matching chairs, formica top, \$25. OS 5-9673 after 6 p.m.

NSU PRINZ, 1960, good trans., \$110; bicycle, Schwinn Superior, 15-sp., \$75; train, elec., HO scale, \$35. 371-6775. A

NASH, Metropolitan, 1959, r/h, \$250; bicycle, girl's, 3-sp., \$12; radio, Nova Tech aircraft receiver, all wave, \$45. DA 7-9291.

CHEVROLET, Impala sport coupe, 1961, p/steering & brakes, r/h, \$1900. 428-2341.

HORSE, red roan mare, 16 hands, 9-yr-old, part quarter, all equipment inc., \$300; basset hound, tri-colored, 3-yr-old, AKC reg., \$100 or best offer. FR 1-1980.

PONTIAC, Tempest, station wagon, 1961, 4-dr., heater, seat belts, stick, \$1300 or best offer. FR 9-6604.

SKI PANTS, women's, black, size 10, \$15; after-ski boots, black suede, size 9, \$8. 837-1541.

TIRE CHAINS, size 6:00-15, 6:70-15, \$5. OS 6-3138.

OUTBOARD MOTOR, 1958 Johnson, 18 hp, w/shift, \$150. 323-0180.

FURNITURE, stereo Hi Fi cabinet, walnut, \$50; sectional, 2-pc., 10', red, \$50; step ends & coffee tables, blonde, \$25; Heathkit W-7M, 55-watt amplifiers, \$40 ea. HA 5-8578.

JAGUAR, 1957, Mark VIII, red leather & woodwork panels, sunshine top, & many extras, \$1300. GE 0-3267.

BOOKS, 15 volumes, for children, age 7-13, by Childcraft Field Enter., Inc., \$30. 398-7417.

FURNITURE, couch, chair & ottoman, beige, make into beds, couch needs upholstery, \$85; dining table w/4 chairs & buffet, \$35; Nauqahyde couch w/table, white, converts into bed, \$20; stoves, 2, gas, O'Keefe & Merritt, \$50; Gaffers & Sattler, \$20; ironer, Kenmore, \$15; radio-TV comb., 28", mahogany cabinet, \$20. 674-4037.

IRONER, Kenmore Deluxe, dual control, \$30; deep freezer, 9 cu. ft., \$25; baby carriage, \$10. OR 1-0357.

CHAIR & ottoman, Danish modern, \$40; patio rockers, 2, \$5 ea.; vacuum cleaner, GE upright, 1-yr-old, \$45. DA 9-9195 after 5 p.m.

Christmas Bowling

Entry Deadline

DECEMBER 8

SEWING MACHINE, White rotary elec., cabinet model, \$40. 564-7288.

PIANO, Brambach baby grand, 5' length, completely reconditioned, \$700. 372-4743 after 5:30 p.m.

VALIANT V-200, 1960, 4-dr., r/h, automatic, \$795. DA 9-6923.

FURNITURE, blonde, bedroom set, 3-pc., \$100; dining room set, 6 chairs, 2-pc. buffet, \$100. PL 4-0021.

AUSTIN HEALEY, 1954, \$550. OS 5-4997.

T-BIRD, 1955, \$1100. 379-6525.

PORSCHE, 1600 coupe, 1957, new clutch & recap tires, \$1775. DA 6-0895.

RANGE FINDER, hunting-type, w/scope, \$9. 329-2371.

FORD, Galaxie 500 XL, 1963, 2-dr. h/top, r/h, p/brakes & steering, fully equipped, 390 V-8 auto., \$2850. OS 5-5489.

FOR SALE

CADILLAC, 1952, 62 series, 4-dr., full power, \$250; antique gold mine shaker, \$25. EX 8-5201.

SKI BOAT, Crackerbox, 16', 48 Mercury V-8 eng., trailer, 16" wheel, skis & misc. equip., \$400. FR 1-2226.

CORVETTE, 1957 convert., dual quads, r/h, auto., 50,000 miles, \$1250. 375-0752.

OLDSMOBILE, 88 Super, 1961, 4-dr., Buick, Special 8, 1962, 4-dr., new tires, \$1995 ea. PL 2-7543.

DIVAN & CHAIR, beige, \$30; coffee table, maple, \$15; chest, 4-dwr., \$5; tow chain, 40', \$2. FR 2-1278.

HUDSON, 1951, 4-dr. sedan, \$50; Hudson, Terraplane bus. coupe, 1937, \$35. OR 2-8629.

COUCH, Danish modern, \$125; matching bookcase, \$20; TV set, maple cabinet, \$25; fur jackets, 2, size 12-14, \$40 ea.; mink collar & cuffs, \$25; other misc. items. EM 2-9380.

COIL SPRING, for 1957, '58, '59 Ford, Edsel or Mercury, \$3.50. EX 6-5797.

BICYCLE, girl's 26" Huffy, \$22; roller skates, Marla Precision, size 8, men's, black, \$45. 371-8564.

FORD, pickup, V-8, 1951, 4-sp., \$450. DA 6-7745.

BICYCLES, Schwinn, 15-sp., \$75; Sears, boy's, 26", \$10. OS 6-0516.

OLDSMOBILE 98, 1957 h/top, 2-dr., full power, rebuilt Hydramatic, new brakes & battery, \$595 or best offer. OX 3-5336.

CADILLAC 62, 1953, 37,000 actual miles, 1-owner, \$500. 378-1038 after 6 p.m.

CRIB, & plastic foam mattress, Baby Line, \$15. OS 6-1673.

RANGE, 1962 Norge elec., copper tone, \$120. TE 2-0690.

CHEVROLET, 1955, 1/2-ton carryall, 6-cyl., stick, radio, 6-ply tires, \$575. FR 9-3294.

BAR, custom hatchcover, \$175. FR 9-3833 after 7 p.m.

PLYMOUTH, Tudor sedan, 1957, auto. trans., r/h, \$650. FR 4-4093.

CHEVROLET, 1956 4-dr. sedan, auto., new paint, chrome rims, dual carb., \$695. OS 6-3792.

PUP, beagle, male, pedigree, all shots, 5-mos-old, \$50. PL 6-0015.

DINETTE SET, 5-pc. wrought iron, table w/2 leaves, \$42.50; chairs, pr., turquoise, Nauqahyde, \$45; heaters, elec., \$5; thermostatic control, \$14.50; toy box, light pink, \$7.50; cocktail table, walnut, \$27.50. OS 5-7938.

CAMPING TRAILER, teardrop, 11', ice box, sleeps 2. \$50. Box 2201.

OLDSMOBILE, coupe, 1949, rebuilt trans. & radiator, \$125. DA 9-4954.

RANGE, O'Keefe & Merritt, gas, sep. griddle & broiler, \$40; ping pong table, \$10; divan, Nauqahyde, \$100; TV, Admiral, 16" portable, \$25. DA 9-7447.

ROCKING HORSE, \$8.50. PL 4-9637.

FIAT 1200, roadster, 1962, Becker radio, custom tonneau, Abarth equip., \$1695. CR 4-7996.

FREEZER, 14 cu. ft., chest-type, \$100. OS 5-6081 after 5 p.m. or weekends.

DRUM SET, bass, snare & tom-tom, \$175; shoe skates, boy's roller w/carrying case, size 5. \$8; size 6. \$12. OR 7-6348.

VOLKSWAGEN, 1955, factory rebuilt eng., \$425. 248-4557.

FORD, 1960 Country Sedan, r/h, automatic, \$995. 679-7806.

BUICK, Riviera Roadmaster, 1955, orig. owner, full power, new brake drums & brakes, \$350. FA 1-0020.

LOT, 1/2-acre in Rolling Hills area, Hermosa to Long Beach view, \$20,000. DA 6-2453.

FURNITURE, sofa & chair, \$15; couch, \$15; table w/2 chairs, \$10; chest of drawers, \$10; desk, \$15; bookcase, \$10; chairs, \$2.50 ea.; washing machine, wringer-type, \$25; stereo console, Philco, \$100; floor lamp w/shade, \$2.50; Plymouth, 1949 convert., \$50; coat, artificial fur dk. arav. \$10. PL 6-7105.

TELESCOPE, 2 1/2", 35, 70, 117 & 234 power, 2 eyepieces, 2-power Barlow lens, sun filter, 5-power sighting scope, tripod & carrying case, \$40. FR 8-2156.

FORD 6, 2-dr., 1954, stick shift, radio, \$125. GR 2-2352.

WIRELESS MICROPHONE, size of kina filter cigarette package, plus 14-tube receiver, \$250. 672-5217.

PLYMOUTH, 1951, 4-dr. sedan, \$50; guitar, student's Hawaiian steel w/case, \$15. OS 6-8997.

DODGE, Custom Royal, 1957, 1-owner, 4-dr. sedan, V-8, r/h, \$395. 789-1698 or 451-3264.

TELEVISION, 23" Westinghouse console, \$75; ski boat, Crackerbox, 12', 25-hp Elgin, controls, trailer, \$150. DA 9-7361.

OLDSMOBILE 88, 1958 convert., p/steering & brakes, r/h, new tires & top, \$895. 679-5913.

CHEVROLET, 1957, 4-dr. Bel-Air, automatic, \$750. DA 4-2689.

CHRYSLER, 1954, 4-dr. New York Deluxe, \$250. OR 2-4050.

RANGE, Norge, gas, 4-burner, \$35 or best offer; chest-of-drawers, 2, 4 drws. ea., \$10 ea.; box springs & mattress, Sealy, \$5. Box 2202.

On Glittering Wilshire Boulevard



WANTED TO BUY

MECHANIC'S TOOL SET, & micrometer set. DA 3-1509.

FILE CABINET, desk & chair. 324-2992.

TAPE RECORDER, 4-track stereo, & a console multiplex stereo phonograph w/AM/FM radio. DA 6-5558.

FOR TRADE

BICYCLE, girl's 24" for girl's 20". PL 6-7337.

RENTALS OFFERED

APTS., 1-bdrm., new, ultra-modern, pool, patio, Lawndale, from \$120. 326-0474.

APT., 2-bdrm., near beach, paneled, carpeted, garage, \$125 mo. 374-4340.

APT., 1-bdrm., 1 blk. from beach, stove, refrigerator, garage, water & trash paid, adults only, no pets, \$85 mo. FR 9-9570.

APT., 1-bdrm., unfurn., stove, carpet, drapes, Long Beach area, \$80 mo. 439-0171.

HOUSE, 2-bdrm., w/garage & patio, corner fireplace, disposal, brick barbecue in kitchen, 1 child ok, \$100 mo. OS 6-0695 after 5 p.m.

APTS., 2-bdrm., pool, patio, all extras, closed garages, near El Camino College & San Diego Fwy., from \$115 mo. DA 9-5986, DA 3-1946 after 4:30 p.m.

APT., 1-bdrm., built-ins, disposal, garage, close to Northrop, \$95 mo. DA 9-0314.

CABIN, 2-bdrm., Big Bear Lake, walk to village, fireplace, sleeps 9, winter rates, \$25 a night for 6 people or less; \$3 a night for each additional person, 10% discount to Northrop employees. DA 6-1173.

RENTALS WANTED

GARAGE, single, w/alley access in Gardena area. Box 2203.

PERSONAL

SINCERE THANKS & appreciation to all our Northrop friends for their expressions of sympathy at the loss of our son & grandson, Mark. BONNIE & LEROY FAIN & MILLIE HULL.

RIDE wanted to Florida or S.E. United States & return for Christmas vacation. Pvt. aircraft preferred, auto accepted. 307-6326.

FOR SALE OR TRADE

SKIL SAW, 7 1/2", const.-type, \$75; hand saw, 6 1/4" Craftsman elec. w/extra blades & carrying case, \$40 or trade for 10" table saw. DA 4-2847.

SEWING MACHINE, fruitwood cabinet, \$35; table lamps & shades, pr., \$10; mixer & juicer, \$10; wristwatch, 21-jewel Bulova, \$25; binoculars, German, \$35; ship model, Hudson's Half Moon, \$50; or trade for liv. rm. & bedrm. furn., dinette set, desk, lamps, record player. 676-5253.

BOAT, 18', cabin, motor & trailer, all access., \$800 or trade for live-in camper. 8'. PL 8-5428.

MOTORCYCLE, 1962 Yamaha, 55-cc, \$225, or trade for 200-cc or 250-cc. ME 4-0898.

CAMPERS HOLD POTLUCK DINNER

Tonight, December 4, the NRC Campers will hold a potluck dinner at the Clubhouse, it is announced by Max Douglas, commissioner.

An exchange of Christmas gifts is planned with a cost limit of 50¢ each. Gifts should be labeled "him" or "her".

NRC EVENT OF THE YEAR—Three ballrooms have been engaged for the NRC Annual Holiday Dance; three bands, Henry Miranda, Mickey McMahon, and Carroll Wax will provide the right music, whatever the mood. Tickets, at Personnel Activities, are \$1.55 each. Dress is semi-formal. Social hour starts at 8. The date is December 7.

Social Event of the Year Set for Saturday Night

The Ambassador Hotel, scene of Los Angeles' most glittering affairs, will be the place to go next Saturday evening, states Bernie Doyle, NRC president.

That evening, all Northrop is invited to the Annual Holiday Dance. Three big ballrooms have been engaged to take care of the crowd. The Ambassador Room, the Boulevard Room, and the Sunset Room. Each with its own

"name" orchestra—Henry Miranda for the Latin side, Mickey McMahon, the twist, and Carroll Wax for the dreamy ones.

Tickets are \$1.55 each and are now on sale at Personnel Activities.

The social hour starts at 8.

Dress is semi-formal. A surprise door prize is waiting for someone.

Continuous Entertainment Planned For Children's Christmas Party

Fact sheet on the upcoming NRC Children's Christmas party:

It will be held on Sunday, December 15, from 12 noon to 4 p.m.

Santa Claus will arrive in a red Cadillac. He is saving Donner and Blitzen and Dancer and Prancer et al, and of course Rudolph in case of fog, for the big run on the evening of December 24.

NRC COIN CLUB TO HEAR TALK BY JOY PARRISH

The NRC Coin Club will hear Mrs. Joy Parrish, nationally known exhibitor and collector, discuss the ancient art of numismatics at the next meeting, December 9, it has been announced.

Mrs. Parrish will bring and display her famous Civil War Centennial collection of tokens, medals, and trade dollars, plus also a selection of other high value coins, U.S. and foreign.

Mrs. Parrish, who holds membership in the American Numismatic Association as well as other state, local and industrial coin and stamp societies, presently has a theme on the life of Father Junipero Serra based on California mission medals in the international writers contest in Madrid.

The meeting will be held in the fourth floor conference room, Engineering and Science Center.

Those attending are asked to enter by Gate 5 where escorts will be provided to the meeting place.

Refreshments will be served.

Location is the NRC Clubhouse, 12917 South Cerise. Cerise is one block east of Yukon and one block south of El Segundo.

There will be free coffee, punch, ice cream, candy, and TOYS! All compliments of the NRC.

Entertainment will be continuous with clowns, a puppy dog act, music by the Star Tones, NRC Symphonaires singing carols inside and outside the Clubhouse, organ music, an electric accordion, and group singing.

SKI PLANS CALL FOR MANY TRIPS DURING SEASON

The NRC Ski Club, George Kern, commissioner, has announced its schedule of weekend outings for the winter.

To Mammoth: December 14 and 15; January 18-19; February 1-2; February 15-16; February 29-March 1; March 14-15; and March 28-29.

Interim trips to local areas: January 11-12; January 25-26; February 8-9; February 22-23; March 7-8; and March 21-22.

Clubhouse meetings will be held Tuesday, December 3; Wednesday, December 18; Tuesday, January 7; Wednesday, January 22; Tuesday, February 4; Wednesday, February 19; Tuesday, March 3; and Wednesday, March 18.

The December 18 meeting will be new commissioner election night, plus a Christmas party.

NORTHROP NORAIR NEWS

Issued biweekly by Norair Division of Northrop Corporation

• Wednesday, December 18, 1963

HAWTHORNE

PALMDALE

EDWARDS AFB

SAN ANTONIO

COMPANY IN STRONG POSITION

A Merry Christmas



And
Happy
New
Year



To all Northrop Personnel:

Mrs. Jones and I extend to you and your families our warmest greetings for the Christmas holidays and our best wishes for a happy New Year.

I want especially to convey my appreciation for the extraordinary efforts so many of you have made to advance the success of Northrop programs.

Thanks to your loyal and dedicated work, we look forward to the New Year with high confidence.

THOMAS V. JONES
President and Chairman
Northrop Corporation

To the People of Northrop Norair:

Once again, as the Christmas holiday approaches, I want to take this opportunity to thank each of you for the loyal and conscientious effort that has made 1963 a year of significant accomplishments. I am confident that 1964 will bring a greater level of activity both in the extension of existing programs and the start of new ones.

Mrs. Nolan and I extend to you and your families our very best wishes for a Merry Christmas and a happy New Year.

DICK NOLAN
Corporate Vice-president
and Norair General Manager

JONES COMPLIMENTS NORAIR FOR ON-BUDGET, ON-SCHEDULE SHOWING

... Northrop has never been stronger financially.

... The facilities and modernization program has grown by \$72 million in the past eight years. By contrast, during the first 15 years of Company life, \$9 million was spent.

... LFC will rank with the jet engine as one of the most outstanding technological aircraft advances in the past 30 years.

... Norair's on-schedule, on-budget performance on the T-38, the F-5 and the X-21, excellent.

... Page, Precision Products, Marine Equipment, due for a 10 to 15 per cent growth in this fiscal year.

... Norair's new twin assembly lines are not only the "prettiest", but are among the most efficient in industry, bringing both better product quality and substantial man-hour savings.

... Northrop's greatest strength is in its people.

Thomas V. Jones, Northrop president and chairman, speaking to a packed house at the Thunderbird on occasion of the Management Club's December meeting, ticked off these salient factors.

He recalled that it was just one year ago, January, that the new Norair twin assembly lines,

side by side, one for the T-38 and one for the F-5 were first unwrapped and shown to the plant public.

"They are still a feature attraction," he said. "Customers say they have never seen anything so pretty in the industry. Then we proudly tell them that
(Continued on Page 2)

Northrop Personnel Honored for Generous Support of Aid-United

Northrop personnel who participate by payroll deduction in AID-United Givers, the Southland's major charity, have been honored for their generosity in the current campaign for funds.

AID-United contributions help meet the health and welfare needs of over 300 services in 155 separate Los Angeles area communities.

Northrop people last year gave \$231,868.33, a record so far during the 1960's. The amount this year will be even higher, by at least \$5000.

A plaque was presented to Northrop by Charles R. Fleishman, president, A. J. Bayer Company and AID-United president. Accepting in behalf of all personnel was J. M. "Mal" Mountain, AID Chapter chairman, and Marie Tully, assistant welfare coordinator.

Since 1955-56, the year the AID payroll deduction program started, Northrop people have

given a total of nearly \$2 million; \$1,915,258.93 to be exact.

Nor-AID, Northrop's program of caring for its own unfortunate ones, is joined with AID-United Givers in that the same payroll deduction accumulates funds for both causes.

Nor-AID is a non-profit tax exempt corporation and is licensed to operate by the state and federal governments. It is directed by a nine-member all-Northrop board consisting of George Gore, Corporate secretary and assistant Corporation counsel and Nor-AID chairman; R. F. Carroll, chief, Industrial Relations, ES&E; John B. Clark, Norair director, Industrial Relations; F. W. Lloyd, Norair vice-president and assistant general manager-Operations; Mr. Mountain; John Richardson, chief, Industrial Relations, Anaheim; R. M. Shave, chief, Accounting and Budgets, ES&E; Paul Wierk, director, Administration, Norair

Technical; and Frank Smith, director, Industrial Relations, NSL.

Nor-AID officers are Mr. Mountain, president and administrator; Marie Tully, vice-president and secretary; and George Forbes, treasurer.

In addition to the above organizational structure, each participating division has a Nor-AID facility committee to directly process hardship cases and other Northrop charity requirements that arise in their area.

It has also been announced that two Northrop men, Marvin Beyrodt, Norair and Robert Cline, Nortronics, have been assigned to participate full time in the AID-United Givers loaned executive program to call on industrial firms to seek pledges for additional charity support. They become part of a 70-man team now in the field. Membership is drawn from prominent Southern California concerns and from governmental agencies.

By an overwhelming vote, Northrop Corporation shareholders who attended the annual meeting December 10 in Hawthorne, authorized the board of directors of the Company to make amendments to the Company's retirement plans to incorporate the "final average" method for computing retirement benefits.

This method, which will result in higher benefits to most retiring personnel, uses the employee's highest paid five consecutive years of service in his last 10 years of employment prior to retirement, as contrasted with the present method, which is based upon the employee's wage or salary during his entire career with the Company.

Thomas V. Jones, president and chairman of Northrop, emphasized that the amendments will not become effective until the board of directors formally adopts them and that their effective dates are dependent upon the determination of the board. Whether the amendments will be made applicable to both salaried and hourly personnel is also left to the discretion of the board of directors.

Mr. Jones reviewed for shareholders the Company's performance in the past fiscal year and

in the first quarter of the current fiscal year, ended October 27.

Reporting on operations for the first quarter, Mr. Jones said sales and other income amounted to \$75,907,000, as compared with \$84,880,000 in the first quarter of the previous year. First quarter earnings were \$1,885,000 or 45 cents a share, as compared with \$2,197,000 or 52 cents a share in the previous year.

"For the year as a whole we expect to keep up the pace and even though in the first six months of last year approximately \$42,000,000 of our sales came from Skybolt alone, we expect this year to achieve a comparable level of sales."

Northrop sales for the fiscal year ended July 31 were \$346,960,000. Net earnings after taxes were \$9,056,421.

Mr. Jones reported that the Company's working capital is higher than it has ever been—\$40,000,000.

Mr. Jones also related the Company has reported that Northrop's cost and management improvement performance, in support of the government's cost reduction program, has resulted in total annual savings of \$22,000,000.

Shareholders Authorize New Retirement Benefits

A Policeman's Letter to Santa

It's that time again when we look ahead to "decking the halls with boughs of holly" and when "visions of sugarplums dance in our heads."

Yes, Christmas is just before us. From now until Christmas Day every publication large and small will be printing Christmas messages and Yuletide stories in the traditional manner.

This column is no exception. This morning's mail happily

standing to help him see the other fellow's needs, as well as his own, behind the wheel; and to light his way safely over the highways in the darkness of the night.

"Give every pedestrian a candy cane of caution that he may walk with care and always reach his destination without accident or injury.

"And if you hang a wreath on someone's door, Santa, please make it a bright and shiny one

By John B. Clark

Norair Director, Industrial Relations

brought some correspondence from the Los Angeles Police Department, enclosing a provocative "Policeman's Letter to Santa."



I hope you will agree with me that its content gives us all food for thought as we approach the holiday season of traffic-jammed highways and intersections, as every-

thing on wheels will be scurrying about, prompted by the "git up and go" activity attendant to the year end. We are indebted to Chief William Parker and Deputy Chief Commander Sullivan of the Los Angeles Police Department for forwarding us a copy of this timely message.

"Dear Santa:

"I realize that I'm asking for an awful lot this year, perhaps more than even you can give, but, since this is not a selfish request, I'm sure you'll do your best to fulfill it.

"As we once again celebrate the birth of the Prince of Peace, bring to every driver the spirit of brotherhood to make him more considerate and thoughtful of his fellow motorists, now and in the new year just ahead.

"Fill his Christmas stocking with great driving skill, good judgment and patience. Leave him a bright candle of under-

representing the new life and the new beginning of Christmas, not the dark and somber wreath of death which has hung on the homes of so many traffic victims at Christmas time in years gone by.

"In closing, Santa, I'd like to ask you to be especially careful yourself this year—so many drivers just don't realize they could kill Santa Claus.

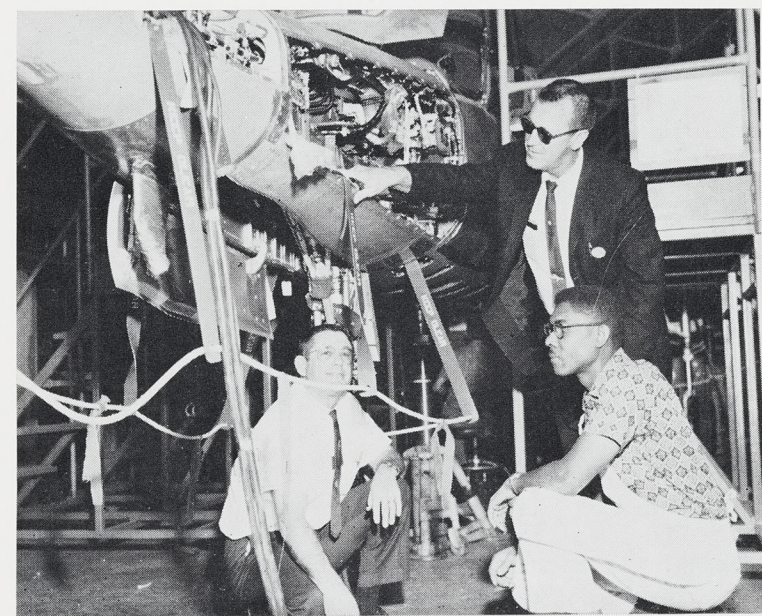
"With best wishes for your safety—

"Your Traffic Officer."

Let us hope that Santa Claus will be receptive to this wisdom. Incidentally, if he is, Santa perhaps, without even knowing it, will be allied with the Northrop Norair current efforts to attain new safety goals. As our General Manager Dick Nolan puts it, "Safety is everybody's business. It's the very essence of employee well-being." Let us all be mindful of this when we are driving during the holidays. Careful, courteous driving will assure us a safe return to Norair following our long yearend vacation. The new year of 1964 must be one of the best in our Company's history. Only we can make it so. So, let's all take it easy behind the wheel over the holidays so that we can put a strong shoulder to the wheel and make our personal contribution to the attainment of our goals.

A safe and merry Christmas to you all.

Leading Safety Parade



SAFETY BARRIER—Number one safety idea from Norair personnel suggested as a part of the sweepstakes campaign is from C. E. Nixon, kneeling at right, mechanic in Advanced Production. A barrier kit to be used during landing gear tests on the T-38 and F-5 promises to protect personnel from wheels and doors as they are hydraulically actuated. Giving a vote of approval are John Vilarino, Palmdale foreman, Flight and Paint Operations branch, and E. J. Sowle, Safety representative. Idea is being recommended for suggestion award evaluation.

HOLIDAY STARTS ON FRIDAY

Norair's traditional yearend holiday will start at the close of shifts Friday, December 20 and continue for 12 full days ending Thursday, January 2.

The extended period of time off—12 full days including 8

weekdays, without loss of pay is made possible by management's action in applying the two floating holidays for 1963, to December 23 and 24. Saturday, January 4, will be scheduled as a workday.

George Forbes, Norair paymaster, has announced pre-holiday paychecks, salary and hourly, second and third shifts will be available to clerks for distribution at 3 p.m., Thursday, December 19. First shift checks will be ready Friday morning, December 20 at 8 a.m.

Upon return after New Year's, the first payday will be Friday, January 3 for second and third shifts and January 4 for the first shift. For detailed information on holiday pay schedules check with organization clerks.

The Norair Group Insurance office will be closed during the holidays and personnel who anticipate a hospital session should make their insurance arrangements before 4:45 p.m., Friday, December 20. Also, the Norair hospital and dispensaries will be closed during the holiday. For emergency medical care for those working during that period, call extension 2211.

The cafeterias will be closed. Personnel Activities office will also be closed but NRC yearend activities will take place as scheduled.

With January 1 just around the corner, one and all are advised that state and federal deductions will be once again a factor in the take-home-pay.

The State Department of Employment, Inglewood office, advises that employee payments for disability insurance remain at one per cent of the paycheck. This year (1964) the amount will be deducted from the first \$5100 of gross wages. Last year only the first \$4600 was taxable. However there are more benefits for injuries and sickness; a rise from \$10 to \$25 minimum and \$75 to \$77 maximum.

This "D-I" insurance deduction is not for on-the-job workman's compensation cases. Workman's "comp" is paid for en-

tirely by the employer.

Neither do employees pay for State of California unemployment insurance. This multimillion dollar tab is taken care of by the Company.

Social Security retirement deductions, the amount taken out of paychecks by the federal government continues to be 3½ per cent of wages paid, same as in 1963. This deduction, matched in amount by the Company, is credited to each employee's Social Security account in Baltimore, Maryland. The take-out is applied to the first \$4800 paid during the year.

Social Security deductions have increased over the years, likewise the benefit rates. In 1951 the amount was 1½ per cent of the first \$3600 earned. The present 3½ per cent for the first \$4800 became effective in January 1963. Additional increases are scheduled for January 1966 and 1968 at which time the current final schedule of 4½ per cent will be reached. The maximum government monthly payment of \$45.60 for retirees in 1949 is now \$127.

NRC GOLFERS ALL SET FOR CHRISTMAS PLAY

The five Ws of Christmas golf

Who: All Northrop golfers.

What: The NRC Annual Christmas golf tournament.

When: Monday, December 30 and Tuesday, December 31.

Where: The Candlewood Country Club, Whittier, on the first day, and the Los Serranos Country Club, Chino, on the second day.

Why: For relaxation and prizes. Prizes will go to first and second and third low net winners in each flight and to first and second overall low net winners.

Entry forms are being accepted through December 19, tomorrow.

Fee, \$8.50 which includes \$1 for the prize fund has to accompany the entry.

AUTO CLUB TO PROVIDE LICENSE SERVICE TO ALL PLANT PERSONNEL

Northrop personnel can renew their automobile registrations for 1964 with the representative of the Automobile Club of Southern California on Mondays and Fridays during January between the hours of 11 a.m. and 1 p.m. at the Norair Personnel Activities office in Plant I, it has been announced by Dick Pryor, general supervisor, Personnel Activities.

Transactions will be handled for the Auto Club by their representative, O. R. Martin, who says that this service is open to everyone, not just Club members.

To renew licenses for 1964, personnel must bring a valid "potential" registration card, which is mailed by the State of

past six years, \$72 million in the past eight years.

Finance—the Company has never been better off financially.

Mr. Jones paid warmhearted tribute to esprit de corps on the part of everyone. He especially paid compliment to Edwards men who are in contact with the customer daily as representatives come in to study or fly the airplanes.

"Every man there is a salesman," he said.

California, along with a money order for the exact amount of the taxes indicated on the potential. Auto Club members may pay by personal check. Money orders for others are available in the Personnel Activities office.

License renewals will be accepted for cars, trucks, scooters, cycles, and trailers.

The last day for leaving registration renewals will be Monday, February 3.

No "out of state transfers" or "change of ownership" transactions can be handled through this service, but "changes of address" can be accepted with the renewals.

NORTHROP NORAIR NEWS

VOL. 21

NO. 23

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A NORTHROP CORPORATION
PUBLICATION
NORAIR DIVISION

Published every other Wednesday

CHARLES BRADFORD, Editor

Permission to publish material with credit to Northrop Norair News will be granted. News office extension—2456. Outside lines—678-9111, OS 5-4611.

Max Fayrweather Appointed Deputy Director, Procurement

Max Fayrweather, 23-year Northrop man, has been appointed to the new position of deputy director of Procurement, it has been announced by Carl Hood, director, Materiel.

Mr. Fayrweather, who will report to Mr. Hood, will have jurisdiction over General Purchasing and Offsite Manufacturing, C. G. Keach and J. W. Korb, chiefs, respectively.

"The appointment is an important adjunct in this department's continuing program of increasing managerial capability and controls," Mr. Hood said. "Mr. Fayrweather, with his many



MAX FAYRWEATHER

years experience and wide knowledge of Northrop business methods and projects, will render valuable service in the expanding field of procurement, both in our near term and long range undertakings."

Division's Value Teams Merged into Single Unit

Norair Value Analysis, Operations department, and Value Engineering, Technical, have now been merged into one element, Value Analysis branch, Technical Organization 3955, it has been announced by Dick Nolan, Corporate vice-president and Norair general manager.

The change was effective on December 9, the date of the announcement, with record changes due December 23.

Value activities as applied to aerospace products is the recurring study of designs, components, and parts with an eye to cost improvement. It is an important management tool contributing to the Division's efficiency programs and was instrumental in helping to achieve Northrop Corporation's cost and

Mr. Hood also advised that new and significant programs are now under way to provide the department with advanced management tools in the areas of cost control and analysis and in program communications and visibility.

The Northrop Norair News is now planning a feature presentation on Materiel's new look to be published shortly after the holiday.

Mr. Fayrweather has been active in management functions in all Norair large production programs. He came to the Company from Douglas Aircraft in 1940 as an aircraft electrician and advanced rapidly through leadman, supervisory, and superintendent echelons on such programs as the Black Widow, the F-15, Snark, Scorpion, McDonnell and Boeing subcontracts and the T-38.

A highly important assignment and one which he achieved with distinction was manager of the Division's site activation project at the Titan Base in Rapid City, South Dakota. Here he assumed the broad management responsibility for all functions including contracts, finance, procurement and engineering. He managed the activities of 1800 people during this time. Procurement played a major part in the successful conclusion of the project in 1962.

Mr. Fayrweather is a native of Michigan. He was educated at UCLA where he attended evening classes. He served in the United States Navy for three years as an electrician's mate.

standards and checking drafting work against these standards.

H. K. "Ken" Davidson, who conducted the similar Operations value studies has been assigned as staff to Mr. Von Essen, specializing in development of training programs, Value Analysis "tools", and reporting systems.

Mr. Von Essen first came to Norair in 1950 as liaison engineer. Since that time he received the appointments of supervisor, Engineering Liaison and project engineer on the Lockheed Electra empennage design subcontract. He was project engineer on the Norair Monorail project and most recently did research and development proposal activities.

Prior to his Northrop association, Mr. Von Essen was vice-president and chief engineer for Ward Concrete Products of Inglewood. He was also design engineer at Lockheed-Burbank. He was educated at the University of Southern California, achieving a bachelor of science degree in mechanical engineering.

Mr. Davidson has long been identified at Norair in Value Analysis work. He was recently distinguished in being elected chairman of the Society of American Value Engineers (SAVE), with a one year term of office starting next January 1. He helped organize the Los Angeles chapter, being a member of a six-man team that launched the activity in 1961. He has served as its historian for the last two years. It is now the largest chap-

Hard Look at High Value



"HI-VALU" PRODUCTION ITEMS—F-5 fighter parts and components are studied for design, cost and manufacturing efficiencies via in-plant symposium staged by Technical and Materiel groups. Here discussing tip tank program from left, Bill Stuart, director, Engineering section; Chuck Keach, chief, General Purchasing; Sal Xifo, director, F-5 Project; Bill Cunningham, F-5 Program office; Frank Lyons, chief, Electronic Systems; John Wolf (back to camera), representing chief, Aero and Propulsion Sciences; Len Peterson (partially hidden), supervisor, Major Subcontracts; W. E. Woolwine, manager, T-38/F-5 Programs; Lowell Yancey (back to camera), chief, Structures and Mechanical Systems; Joe Barlow (partially hidden), chief, Materiel Programming; Carl Hood, director, Materiel; Jack Korb, chief, Offsite Manufacturing; and Steve Smith, F-5 Program office. Thirty separate airplane items on display, including per ship cost of each, served to graphically illustrate cases-in-point areas targeted for improvement. Vendor capabilities, in addition to product quality, quantity, schedules, was weighted factor in cost improvement deliberations.



PAUL VON ESSEN



KEN DAVIDSON

ter in the United States.

Mr. Davidson was recently appointed by the Society to serve as general chairman of its third annual meeting to be held in April, 1964.

Mr. Davidson came to Northrop in 1951 following his retirement as captain in the United States Navy.

His first position here was in Education and Training, specializing in organization and management. He was also supervisor, Wage and Salary and subsequently was instrumental in launching Norair's first Value Analysis program. He has been engaged in Value work for the past five years.

Mr. Davidson was educated at the Naval Academy, Annapolis and served with distinction throughout World War II and the early stages of the Korean conflict. He was awarded the Commendation Medal and the Legion of Merit.



CASTING ACHIEVEMENT—F-5 pylon casting seen on table represents most advanced state-of-art in terms of high strength ratio compared to size and weight. Messrs. Yancey, Stuart, Korb, Hood, Xifo, and Keach compare views on hardware and discuss ways to achieve greater value commensurate with design integrity. Components evaluated included such major items as the 150-gallon fuel pod, 50-gallon wing tip tank (seen above), inlet duct, air conditioning system, high-cost actuators, valves, relays, and hydraulic and electrical components.



AT HUNTSVILLE — Northrop Space Laboratories' H. L. "Hal" Snow, Materiel coordinator at Huntsville, receives his 10-year pin in special presentation from R. P. Jackson, NSL vice-president and assistant general manager. Extending congratulations are, at left, J. A. Barclay, manager, and at right, A. A. Demetriou, assistant manager of the facility. Hal first joined Northrop in 1953 at the Cape. He moved from there to the T-2 Site at Rapid City and then to Huntsville. Holiday activities at Huntsville include an NRC Children's Christmas party to be held in the new 20,000 square foot facility plus a dance party which took place December 14.

BUY BONDS

management improvement savings of \$22 million during the past year as reported by Thomas V. Jones, president and chairman, at the Company shareholders meeting.

Paul Von Essen has been appointed supervisor, Value Analysis. The branch will report to J. D. Matthews, manager, Technical Operations department.

Value Analysis, in addition to product cost improvement, will also be responsible for establishing and maintaining drawing



RIDES WANTED

7 a.m. — 3:45 p.m.

PIER AVE. & PACIFIC COAST HWY., Hermosa Beach. Sarah Weatherington. ext. 1860. 376-1467. 2

WILSHIRE, SANTA MONICA, BROADWAY, PICO, Santa Monica. Need ride for 2 or 3 weeks. W. A. Brent, ext. 1750. 2

OXNARD & WOODMAN, Van Nuys Eleanor Reeves, ext. 1332. 2

7:30 a.m. — 4:15 p.m.

SEPULVEDA & CULVER BLVD., Culver City. E. D. Peden, ext. 4284, Ex. 1-7014. 3

8 a.m. — 4:45 p.m.

HAWTHORNE & EMERALD, Torrance. Erna Curtis, ext. 724. 371-7807. 5

REDONDO BEACH BLVD. & NORMANDIE AVE., Gardena. Bernice Oddy, ext. 1513. 329-6266. 5

4:45 p.m. — 1:15 a.m.

HAWTHORNE & MANHATTAN, Lawndale. Owen J. Ryan, ext. 658. 679-7275. 8

RIDES OFFERED

7 a.m. — 3:45 p.m.

MARINE & MANHATTAN AVE., Manhattan Beach. J. M. Sperson, ext. 629. FR 9-5044. 12

OXNARD & WOODMAN, Van Nuys Eleanor Reeves, ext. 1332. 12

BBSF Classified Ads

BBSF classified ad service is provided free of charge to all Northrop Norair personnel.

Ads for agencies, commercial enterprises and private businesses are not accepted.

Deadline is noon Wednesday, one week before publication.

FOR SALE

BOAT, 16' Glasspar, MK58A Mercury motor, aator tilt trailer w/spare wheel & fire, cover, life jackets, ski equip., \$995. 831-9707. A

COUCH, reupholstered, \$40. FR 9-9570. A

BUICK, Special station wagon, 1962, auto, trans., \$1995. EA 2-3352. A

GUITAR, Orpheus elec., \$75; sailboat, Sabot. \$275. FR 5-6364. A

BOAT, 18', Mercury 400, lae. wheel trailer, Ridequide steer., elec. starter, bait tank & pump, \$100 down, \$995. DA 7-0304. A

RACE CAR, Crosley ena., H-mod., tube frame, alum.-fiberglass body, Fiat close ratio trans., \$800. 673-2158. A

BINOCULARS, Selsi, wide angle, 7x35, 6-mos-old, \$20. Box 2301. A

SECTIONAL, 2-pc., rose, \$35; coffee table, maple, \$25. OS 6-4388. A

AUTOS, 2 Fords, 1951 convert., \$150; 1960 4-dr. sedan, \$1100. OR 8-7374. A

RIFLE, Remington Nylon 66, 22 cal. w/ chromed barrel & receiver, \$38.50. FR 8-7577. A

REFRIGERATOR, Frigidaire, \$35. AX 2-4958. A

TAPE RECORDER, Ampex, model 960, 2 & 4 track, \$300. ME 4-7643. A

FORD, 1954 sedan delivery, aood rubber, \$250. PL 4-6146. A

CORVAIR, 1960 deluxe 700 series, r/h, w/w, floor shift, \$900. OR 1-4845. A

STOVE, Frigidaire, elec., \$20; horse on sprinas, \$8. 676-9678. A

DOLLS, Barbie & Ken w/14 sets of clothes, \$25. 676-5834. A

RUG, w/pad, 9'x12' beige wool, \$30; Hi Fi, Hoffman, blonde w/radio-phone AM-FM, \$20; record player, all speeds, \$8; kitchen table, formica top & chairs, \$10; stove, apt-size, white, \$20; or best offer on all items. 376-9704. A

DISHWASHER, 1963 Sears, used 6 mos., \$115; range, 1960 GE elec., \$115. OS 5-6430. A

VIOLIN, American, handmade, Stradivarius copy, \$100. 366-1827. A

RADIO, Packard Bell AM-FM "brand new," 9 trans., \$35. VE 7-3671. A

EVENING DRESS, full length, royal blue brocade, size 16, \$30; washer-dryer, Bendix, aas, \$125; reverberation unit, \$30. Box 2302. A

BUICK, La Sabre, 1962, 2-dr. h/top, p/steering & brakes, \$2800; tape recorder, transistor-type, \$25. OR 7-4405. A

FOR SALE

RIFLE, .22-cal., single shot, J. C. Higgins model 41 w/4 power telescope, \$15. OR 0-3733. A

SCALE, white, Decto, bathroom-type, \$2. 371-9651. A

DINETTE SET, 7-pc., 3'x6' No-Mar surface table w/6 chairs, \$25. DA 9-7338. A

STOVE, Tappan deluxe, aas, auto. controls, \$85. PL 4-5909. A

MERCEDES-BENZ, 1957, 190 SL, convert. h/top, \$1750. 645-2097, PL 6-8141. A

CHAIRS, 2, plastic upholstery, blonde finish, \$5 ea. 675-8413. A

MOVIE CAMERA, 8mm, Bell & Howell, elec. eye, w/3 fast f/1.8 lenses, speeds 10-40, \$69.95; Childcraft library, 15 vols., for children 5 to 13, colored illustrations, \$25. 398-7417. A

OLDSMOBILE 88, 1954, factory air cond., p/steering & brakes, r/h, aood Nylon tires plus 2 spare wheels & tires, orig. owner, \$450. WE 8-8374. A

DRAFTING MACHINE, Brunning, 18" arms, \$60. AX 1-7438. A

BUICK, 1955 2-dr., rebuilt ena. & trans., \$300 or best offer. PL 5-1949. A

CHINESE PAINTINGS, 2, bamboo, \$10 ea.; movie camera, Lumicon-8, turret, exposure meter, \$18. 323-8938 after 5 p.m. A

MIXER, Dormeyer, 10 spds., food arinder attach., \$22.50; kittens, Siamese, pedigree, vaccinated, 5 weeks & up, \$35. OS 5-9789. A

RADIO, citizen's band, executive model 100, \$150; shaver, Remington 4 elec., used twice, \$10. 370-4251. A

REFRIGERATOR, Leonard, \$35; trailer hitch, hvy-duty, \$15; coil springs, hvy-duty, for 1957-1959 Ford, \$6. 375-9337. A

FORD, station wagon, Fordomatic, w/w, r/h, p/steering & brakes, 4-dr., \$399; bicycle, 20", puncture-proof tires, \$10; TV, table, 16", \$24. EX 8-5201. A

MODEL RAILROAD EQUIP., HO scale, 5 enas., pass. & freight cars, kits, track, transformers, \$75. GL 4-1708. A

TV, 17" Zenith, cost \$225, \$50 or best offer. OS 5-7969. A

HOUSE, 3-bdrm., 1 bath, walking distance to Del Amo shopping center, walnut paneling, cinder-block wall, fireplace, carpeting, patio, 2-car aaraage, financing avail., \$21,500. FR 5-2866. A

REFRIGERATOR, Philco, 8.5 cu. ft., \$35. PL 4-5358. A

HUBCAPS, wire-wheel, for compact car, \$25. 372-7569, 376-5094. A

PONTIAC V-8, 1956 4-dr., power brakes, new tires, \$375. HA 1-2259 after 5:30 p.m. A

PING PONG TABLE, 2 section-type, steel leas, \$15. FR 5-2127. A

MILL, horizontal, \$475; turret lathes, 2, #2, \$300; #2 1/2, \$125; boat, 16', motor, Scott 35-hp, \$545. OR 7-6348. A

DINETTE SET, wrought iron, pink & white, \$40; chaise lounge, foam rubber cushions, \$35. OR 0-7361. A

SOFA, modern, 8', converts into bed, w/innerspring mattress, \$185; coffee table, \$15; table lamp, \$8; range, O'Keefe & Merritt, chrome-top, \$95; table, chrome & 4 chairs, \$25; washer, Kenmore auto., \$65; cabinet, 73" w/21" TV in center & 12" comb. speaker mounted in each end for hookup to Hi Fi, \$125; adding machine, Smith Corona, \$49; many other items. OS 6-3874. A

PICKUP TRUCK, 1959 Ford, 1/2-ton w/8' bed, \$950. 697-3328. A

HONDA, 1962 110 delux 50cc, \$265; bicycle, boy's Schwinn, 3-spd. axle, 26" racer, \$25. OR 0-2256, 670-2702. A

DODGE, Custom Royal, 1957, 1-owner, 4-dr. sedan, V-8, r/h, \$325. 789-1698, 451-3264. A

KNITTING MACHINE, Stick-Matador w/ stitch counter, needle bed, 164 or 197 & working slide, \$100. OR 0-2564. A

DAVENPORT & CHAIR, Nylon frieze, \$50; dress, ladies' lightweight black wool, size 16, \$7.50. 371-8304 after 5:30 p.m. A

FORD, 1953 4-dr. sedan, heater, \$2.95. OR 4-9599. A

ENLARGER, 4"x5" condenser-type, Wollensaak Velostigmat, 162-mm, f/4.5 lens, \$45. FR 8-5856. A

FORD, 1958 convert. r/h, automatic, \$475; Plymouth, 1957 9-pass. station wagon, r/h, automatic, \$395. EA 2-0646. A

STOVE, Gaffers & Sattler, 38" lona, \$35. OS 6-0573, DA 9-2556. A

RIFLES, Winchester 30-30, model 94, \$65; Remington, 22-cal. Nylon 12, \$45; Apache scope, 510-4x, \$35; Mauser, \$60; case, leather quilted, \$6. 634-5223 before 3 p.m. A

BUICK, Riviera Roadmaster, 1955, orig. owner, full power, new brake drums & brakes, \$300. FA 1-0020. A

ARCHERY EQUIPMENT, full recurve bows, 2, Herter, 40# & 47#, spineing machine, magnetic fletching turntable that feathers 1/2 doz. arrows at once, many extras, \$50. FR 9-3003. A

MONZA, 1961, 98-hp, 4-spd., dual exhaust, chrome rev. wheels, WSW tires, \$1495. ST 9-2369. A

STOVE, Chambers, aas, \$20. 326-5471. A

FOR SALE

TRIUMPH TR-3, 1956, supercharger, wire wheels, new tires, \$795. WE 9-5844. A

GUN, Crossman pellet-type, CO₂ cyl., 22 cal. single, \$12. FR 8-1751. A

MOBILE HOME, Travelo, 2-bdrm., 10'x55', 8'x16' Add-A-Room, alum. awning, porch, forced air heating, early American furniture, \$6950; TV, comb., Olympic, 24", stereo & AM-FM radio, \$250; birch desk, 24"x60", \$70. 325-2042. A

TV, 21", \$50; tape recorder, Pentron stereo, \$95; bar-b-q \$7.50; clarinet, B-flat, \$35; flute, \$20. FR 5-3359. A

MOTORCYCLE, 1959 Matchless, 650-cc twin, \$650. OR 1-1660. A

T-BIRD, 1958 convert., new black top, p/steering & brakes, \$1495. GL 4-2057. A

TUNER, FM Harmon-Ka-Lan F-500, \$100; amplifier, A-500, 50-watt stereo, \$125; adaptor, FM multiplex, Eico, \$40. 354-2695 days. A

WANTED TO BUY

TABLE SAW, 10". DA 4-2847. B

REVOLVER, 22 L-R. OS 6-8842. B

ACCORDION, professional model w/elec. pickup. OS 6-8331. B

RELAX-A-CIZOR. DA 9-9581. B

FOR TRADE

OUTBOARD MOTOR, 7.5-hp, Scott twin, trade for drill press, small bench-type. 329-0358. C

RENTALS OFFERED

APT., 1-bdrm., custom decorated, subterranean parking, pvt. decks & pool, \$137.50. 326-0474. E

APT., new 3-bdrm., 1 1/2 baths, built-ins, fireplace, carpets & drapes, lae. patio & pvt. aaraage, near Northrop, children ok, \$165. OS 5-7839. E

HOUSE, unfurn., 2-bdrm. & den, Redondo Beach, \$110 mo. FR 9-9735 before 3 p.m. E

GIRL will share apartment, Manhattan Beach, \$50 mo. 374-7844. E

APTS., 1 & 2 bdrm., unfurn., carpets, drapes, built-ins, pool, patios, sun-deck, close to Torrance & Hawthorne Blvds., no children, from \$110 mo. 370-3347. E

APT., lae., 2-bdrm., carpets, drapes, soundproof, insulated near Northrop, \$110 mo. OS 5-6032. E

HOUSE, 2-bdrm., furn., children ok, \$125 mo. 679-7584. E

HOME, 3-bdrm. & den, fenced yard, Baldwin Hills area, \$250 mo. AX 3-4569. E

APTS., 2-bdrm., furn. & unfurn., lae. pool & patio, all extras, closed aaraage, near El Camino Col. from \$115 mo. DA 9-5986, DA 3-1946. E

DUPLEX, lae. 2-bdrm., upper, newly redecorated, \$135 mo. 322-2804. E

APTS., 1 & 2 bdrm., built-ins, w/w carpet, drapes, 2-bdrm. have 2 baths, \$90 & \$130 mo. OS 5-2978. E

DUPLEX, 1-story, children & pets ok, range & refrigerator avail., fenced yard, paved parking, on bus line, Rosecrans near Aviation Blvd., \$70 mo. 679-8867. E

APTS., 1, 2 & 3 bdrm., new, modern, pvt. patios, carpets, drapes, built-ins, hobby shop, Torrance area, from \$95 mo. FR 5-0867. E

RENTALS WANTED

HOUSE 2-bdrm., furn., in N. Redondo area. FR 9-3833. F

GARAGE, single, within 10 min. walking distance of Engineering & Science Center, needed only on weekdays from 7:40 a.m. to 4:50 p.m. ME 3-7684. F

WANTED, college grad to share 4-bdrm., 3-bath home w/3 others, N. Redondo Beach. 676-3828 after 5 p.m. F

PERSONAL

WE WISH to express our deep appreciation to all our many friends at Northrop for their floral tributes & messages of sympathy due to the loss of our beloved mother & wife, Helen McCracken. TOM McCracken & FAMILY. L

I WISH to thank everyone who has been so very kind & helpful to me during my recent illness. My husband & I extend to all of you our sincerest wishes for a Happy Holiday Season. LEE MASSEY. L

LEAVING for Cleveland, Ohio & return over Christmas holidays. Share driving & expenses w/1 person. 676-8406 after 6 p.m. L

FOR SALE OR TRADE

CAMERA, K20 aerial, \$125 or trade for movie camera. GA 2-5444. M

ACREAGE, 5.14, near Fallbrook, on county road, water & elect., cabin, approx. 900 sq. ft., other improvements, \$6500 equity or trade on other property. 676-5253. M

Annual Holiday Dance



HAVING A BALL AT THE BALL—Norair partygoers at the annual holiday dance at the Ambassador trip the light fantastic to the strains of sweet music. There was a big crowd. Everybody had fun. Social hour started at 8. Festivities continued until 1:30 a.m.



THAT-A-WAY—Eagerly anticipating biggest social event of the year, arrivals are directed to the exclusive NRC ballrooms. Pointing the way is Walt DeVore.



AND THE WINNERS—Mr. and Mrs. Sam Nichols, right, are awarded "Glory of Christmas" L-P, one of door prizes. Extending congratulations are Fritz McLarney, NRC special events chairman; and band leader Carroll Wax. Mr. Nichols is a Norair plant protection officer.

NRC SCHEDULES NEW SERIES OF DANCE CLASSES TO START JAN. 9

One of the first NRC events for early 1964 is a new series of dance classes to be held at the Clubhouse, 12917 Cerise, it has been announced by Hank Solak, dance commissioner.

The series which will be held from 7 to 10:45 p.m. on Thursdays are the cha cha and the waltz during the first session, the waltz and eastern swing during

the second period, and with the end of the evening devoted to the eastern swing and the cha cha.

Cost for 10 weeks is \$10 a person with registration night limited to the first two weeks, January 9 and 16.

Bill Martin will be the instructor.

Singles or couples are welcome.

Merry Christmas from the NRC

NORTHROP NORAIR NEWS

Issued biweekly by Norair Division of Northrop Corporation

• Wednesday, January 15, 1964

HAWTHORNE

PALMDALE

EDWARDS AFB

SAN ANTONIO

Over Two Million Cost Improvement

First F-5 Service News Distributed to Customer

First issue of the Northrop Norair F-5 Service News, volume 1, number 1, has been published and distributed to customers at home and overseas.

The F-5 Service News, companion publication to the T-38A Talon Service News, comes under the jurisdiction of Norair Product Support, Frank Mathes, manager.

The cover on the first issue depicts the F-5A symbolically bursting forth fully armed from the lines of a stylized blueprint as the new and potent multimission fighter for America's allies in Europe and Asia.

Jim Anthony, recently retired USAF major and formerly T-38 project officer with the Northrop Air Force Plant Representative's office, supervises the production of the Service News publications in addition to his other supervisory duties in the Product Support department. Jim is especially qualified due to his knowledge of the T-38 and F-5 development programs. As an Air Force command pilot he has flown many flight test hours in both the T-38 and F-5 aircraft.

Editor of the Service News publications is F. M. Edwards. Prior to coming to Northrop, Mr. Edwards was editor of the USAF Flying Safety magazine.

Staff in addition to Mr. Edwards is composed of W. W. Hagemann, art editor; W. T. Plummer, writer; and A. H. Berg, jr., artist.

Address is Product Support, F-5 Service News, Northrop Norair, Northrop Corporation, 3901 West Broadway, Hawthorne, Cal-

ifornia 90250.

F-5 articles in the first issue include "F is for Fighter" which outlines design concept, purpose, safety and reliability, pilot inputs, and performance.

"Flight Test," details the various elements of the fighter's flight test program.

"F-5A/B System Briefs" explains briefly the hydraulics, fuel, and electrical systems with schematic outlines.

"Step Up" is an illustrated introduction to the cockpit.

The F-5 Service News is similar in format to the Talon Service News. The two publications will be issued on alternate months.

SAVINGS PLAN CHANGES OKAY IN FEBRUARY

Norair salaried folk who participate in the Company's Salaried Employees' Savings Plan may change the amount of their contributions next month, it is announced by Dave Stadler, chief, Personnel.

Changes for the period can be adjusted to conform with individual salaries in effect on November 1, 1963. Changes can also be made in the allocation between the bond fund and the stock fund.

Application cards can be obtained from Personnel office, Plant One, extension 642 or from the Compensation Administration branch office, Engineering Science Center, extension 4028.

Applications must be completed and filed at Personnel, Plant One before February 3.

T-38 FEATURED IN McNAMARA AND ZUCKERT COST FILMS, HYDRAULIC REDESIGN A VALUE CLASSIC

Northrop's Cost and Management Improvement Program has written a proudfest record for the first quarter of Fiscal 1964.

CMIP is the plan by which the Company is in all-out support of the Department of Defense in helping the nation buy more weapon systems, services, and mater-

iel for the tax dollars provided by Congress.

Corporate grand total of dollar improvements in all categories reported for the first quarter came to \$2,289,812. There were 334 separate cost improvement actions. Norair's share for the three months came to \$824,737. The remainder came from efficiencies under way at Nortronics, Ventura, and Northrop Space Laboratories.

A review of the Cost and Management Improvement Program first quarter report shows that cost reductions have been achieved practically in every phase of Company activity.

Individual interest and awareness of the program is increasing daily, it is reported. Ideas turned in during the quarter ranged from a low of \$17.40 to a high of \$183,002.

Reduction of operating costs proved to be the most fertile field wherein 229 items realized \$1,236,203. These came under the headings of adoption of more efficient methods, plant rearrangement, use of more modern equipment and the elimination of unnecessary operations.

Buying only what is needed in 28 actions accounted for \$568,802. Headings here were more efficient use of excess inventories and value engineering studies.

Buying at lowest sound price, the third category, brought \$484,807. Savings here were in the areas of improved procurement

practices and increasing competition for procurement.

The Corporate CMIP program is directed by William H. Gurnee, assistant to the senior vice-president, Administration.

At Norair reduction of operating costs accounted for \$414,379.

Buying only what is needed showed dollar improvement of \$287,265.

Buying at lowest sound price, \$123,093.

Norair's share of the Corporate savings when broken down into departments showed:

Operations, \$372,500. Major segments reporting were Manufacturing, Materiel, Production Engineering, Product Support, and Value Analysis. Note—Value Analysis has now been made a part of Technical's Value Engineering and its savings will be reflected from that area in the next report.

Administration department, \$258,300.

Technical, \$97,770.

Quality Control, \$86,100.

Finance, \$10,067.

Norair's Cost and Management Improvement Program overall coordinator is Warren Sparks.

Coordinator for Finance is George Reed, director, Budget Administration; for Technical, Ted Hamlet, special assignments for Program Administration; for Operations, W. A. Whitman, director, Manufacturing Program

(Continued on Page 4)

Honored



CANE CUTTER — W. W. "Millie" Millikan, Norair director, Eastern Regional office, Washington, D.C., and brigadier general, Air National Guard, has been commended for his leadership in recent Operation Cane Cutter which demonstrated increasing capability of Guard units to move long distances. "Millie" took his 113th Tactical Fighter Wing to Puerto Rico, refueling en route several times, for first overwater deployment of Century Series aircraft. And all without a hitch. Commendation came from TAC Commander General Walter C. Sweeney, and from Guard officials. Story of Cane Cutter is featured in current issue of Air Force Magazine.

Money Saved On Talon "Eye-lids"

Washington (AFNS)—A cost conscious technical sergeant at Webb AFB, Texas, has found a way to extend the life of afterburner eye-lid leaves on T-38 Talon jet trainers and save the Air Force many dollars in labor and replacement costs.

TSgt. Roy McMullin noticed while pulling 100-hour inspections on the aircraft that a high proportion of the leaves had to be replaced due to excessive wear. It costs approximately \$800 per engine to replace the leaves

(Continued on Page 3)

Worldwide Network To Support F-5 Fighter

The U. S. Air Force's worldwide logistics and supply network will support Northrop F-5 jet fighter-bombers when they go into service this year with certain Free World air forces being modernized through the U. S. Military Assistance Program.

Center of the USAF support program for the F-5s will be the USAF Logistics Command's vast Middletown Air Materiel Area, known as MAAMA, at Olmsted Air Force Base, Pa. MAAMA already is providing logistics support for aircraft, helicopters and airborne missiles in service throughout the world.

The Middletown facility will serve as F-5 systems support manager and storage site for collection and shipment of all F-5 supply items. Complete initial supply requirements are programmed for delivery to designated F-5 bases abroad one month before arrival of the first F-5 aircraft.

The F-5 is a twin-engine 1000-mile-per-hour fighter-bomber. It can carry 6200 pounds of bombs,

rockets, missiles, napalm and fuel, and is armed with two 20 millimeter nose cannons. There are two versions, the single-seat F-5A and the two-cockpit F-5B, which can be used as a fighter or trainer. First deliveries to operational squadrons are scheduled to begin in mid-1964.

The supply requirements for the F-5 in various countries, each with unique operating conditions, have been established as a result of joint surveys carried out by the individual national air forces, the U. S. Air Force and technical representatives from Northrop and General Electric. General Electric manufactures the J85-13 jet engines which power the twin-engined F-5s.

Although the F-5 is a modern, high-performance supersonic fighter-bomber, it will actually require less logistic support than the older subsonic aircraft it is replacing. This is the result of designed simplicity and the light weight concept of the aircraft and its ground support equipment.



THE FIGHTER—F-5 Service News, volume 1, number 1.

New Corporate Computer Setup Scores Advances

Advances springing from a bold new step taken by Northrop in the growing field of automated data processing and computing are being recorded in all divisions of the Company today.

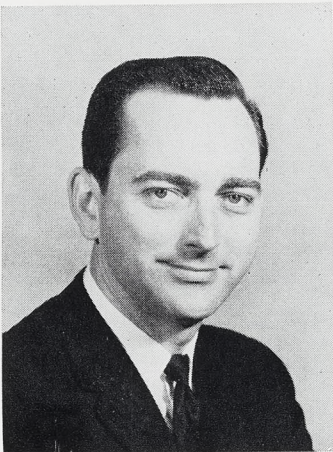
All computer organizations have been made part of a centralized Corporate Data Processing department, implementing the dictates of a recent policy directive to optimize the company's capabilities in this field.

The new organization, 800, is a service-oriented enterprise responsible for ordering, installing and operating all of the company-wide data processing installations. It is believed to be the first time the management of a large corporation has assumed centralized control of all aspects of data processing.

The system is designed to level the load of data processing work throughout the corporation. Thus cost reduction through more efficient equipment utilization and service is an important benefit of the system.

But it is only one of many benefits, according to Milton M.

DATA DIRECTOR



Maurice P. Chrysler, site director, Data Processing department's site at Norair, comes to Northrop from Collins Radio, where he was manager of Systems and Techniques and from Univac and Arthur D. Little, Inc., where he was engaged in consultant work.

Mr. Chrysler was educated at Kansas State Teacher's College, B.S. in mathematics and Kansas State University, achieving a master's in math.

His hometown is Pittsburg, Kansas. He hobbies in golf and woodworking.

Stone, Corporate director of Management Information, who originated and set up the department.

"Another important one, especially for the people involved," he points out, "is the establishment of a known, in-depth job ladder for all professional data processing personnel."

The department contains about 350 people, Mr. Stone says. Thus its personnel have a greatly expanded organization of professional stature within which they can advance while at Northrop.

Scarcely a ripple was caused physically by the changeover as all equipment and sites remained at their previously established locations. The difference was that the divisions suddenly became buyers of computing services instead of computer owners.

Replacement and regrouping of equipment and machines is planned as needs are ascertained in the future, Mr. Stone says.

Heading operations at each of the computer locations is a site director, and when fully staffed, his deputy. Size of the facilities at different sites varies with their individual purposes and capabilities.

The facility at Northrop Norair has an IBM 7090, the largest of all the Company's computers, used for a wide range of business and technical uses.

Maurice Chrysler is site director for this facility, located in the Engineering Science Center. He is assisted by Deputy Site Director Dennis Lee.

The unit located at Plant III, Hawthorne serves ES&E and NSL. It contains an IBM 1410, an intermediate-size computer. Used for business purposes such as payroll, inventory control, and work in process, the facility is headed by Site Director Bob Joslyn and Deputy Director Al Steed.

The unit located at Anaheim serves ES&E and SSD. It contains an IBM 7040, a large computer capable of a wide variety of business and technical applications. Bob Gordon is site director assisted by Deputy Site Director Art Phelan.

The Massachusetts site has equipment located at both the Marine Equipment and Precision Products departments. A 604 calculator and 407 tabulator are used at MED, while an IBM 1401, a small-size computer for business applications is located at PPD. The facility is under the direction of Paul Mandel, jr.

The unit located at Northrop Ventura contains an IBM 7040, a large computer capable of a wide variety of business and technical applications. The facility is headed by Site Director John Lowe.

A planning group has been established to aid in the utilization of all data processing resources. Personnel in the planning group and their special areas of responsibility are: Senior Scientist Lee Ohlinger, Computer-Aided Engineering; Ed Piper, technical director, Equipment and Facilities; Wylie Robertson, technical director, Programming Systems and Languages; Data Processing Specialists Al Nichols, Recording and Cost Statistics; Dudley Short, Applications and Systems Study; and Ed Allee, Forecasts and Cost Analysis.

CAMPERS PLAN FOR POTLUCK AND MOVIE

The NRC Camping Club is holding a meeting and potluck dinner on Wednesday, February 5 at 6:30 p.m.

Bring favorite dish and your own table service, says Max Douglas, commissioner.

A movie is on tap.

NORTHROP NORAIR NEWS

VOL. 21

NO. 24

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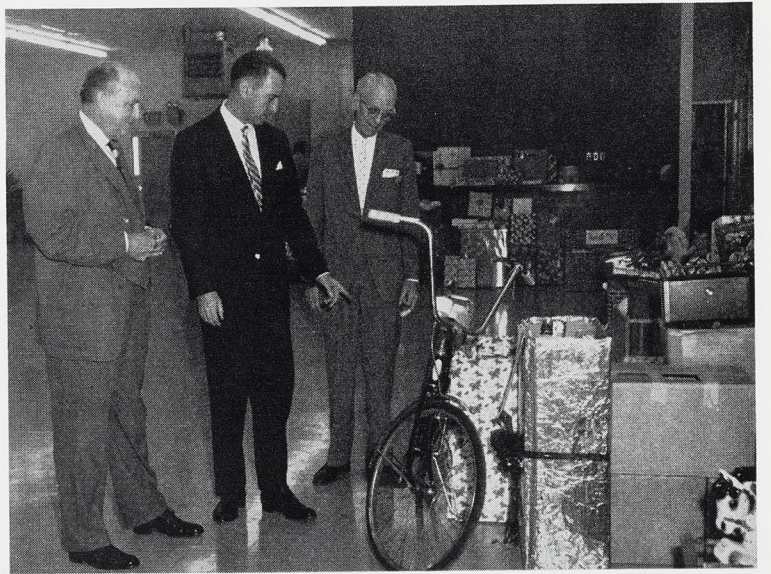
CHARLES BRADFORD, Editor

Permission to publish material with credit to Northrop Norair News will be granted. News office extension—2456. Outside lines—678-9111, OS 5-4611.

Adopted Family Program

HAPPINESS AT YULETIDE—

Top Corporate officials Robert R. Miller, senior vice-president and Thomas V. Jones, president and chairman of the board; and Mal Mountain, Norair welfare coordinator, view results of Division Adopted Family program just prior to the holidays. Outpouring of gifts once again proves that helping others in time of need makes the Christmas season most satisfying and complete. Note "long horn" bicycle coming up for an adopted family junior.



SANTA CLAUS ON ASSEMBLY LINE—

Norair men and women from Boeing Aft section, Outer Wing, Manufacturing Engineering, Production Planning, and Tool Engineering and Tool Liaison, stack their family presents neatly beside the line in new assembly building.



PRODUCT SUPPORT —

One of the finest Adopted Family gift showings was that turned in by Product Support. Here posing proudly with their collection from pre-Christmas Eve labors are from left, front, Donna Miller, Tomi Alegria, Anna Nelson, and Lucile Kaulukukui. Back row, from left, Gail Skinner, Ed Geyer, Buck Marshall, Floyd Edwards, and Jim Anthony, department chairman.



Advanced Logistics



HIGH GRADE — James W. King, supervisor, Logistics Plans and Programs, Product Support, has just returned from six weeks at the Air Force Institute of Technology where he completed advanced logistics requirements course and received third highest grade in the class. Mr. King is first of Norair contractor personnel to attend the school. With the Company since 1954, he has been continuously identified with spare parts and logistics. He started in aerospace in 1944 at Douglas Aircraft as a riveter on the line.

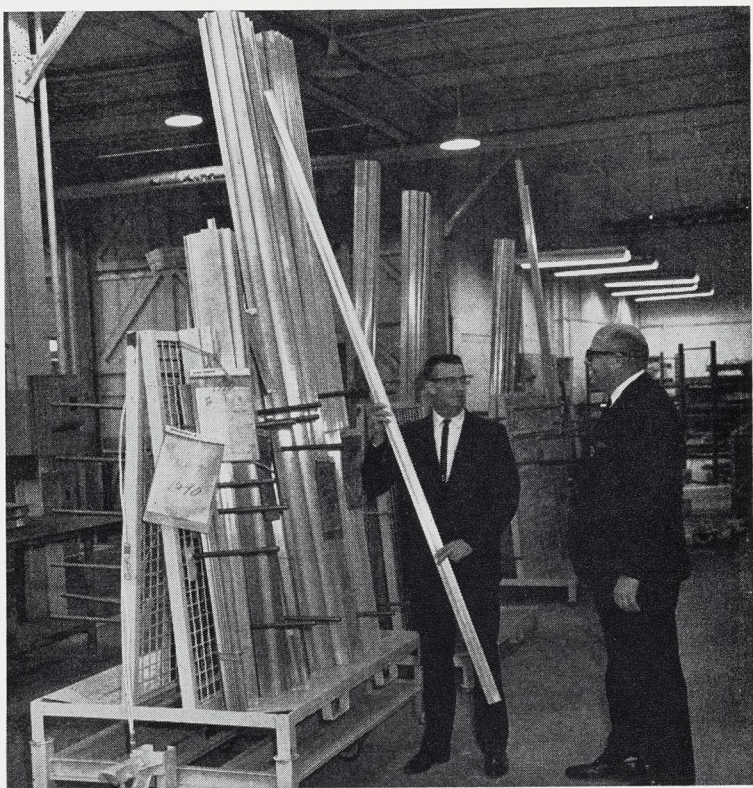


THREE-TEAM TEAM—Contract Administration, Contract Pricing, and Cost Estimating team combine efforts to convince their Adopted Family that there really is a Santa Claus. From left, Gladys Burks, chairman; Bill Lurie, Helen Judd, Florence Burke, Charlene Kuist, L. J. Holder, and Judy Sherman.



NORTHROP SPACE LABS—Santa's reindeer have nothing on Space Labs personnel. From left good cheer workers are Doris Betonte, co-chairman; Cecelia Hart, Jo An Alves, and Nancy Blaine, co-chairman. Presents were brought from home and assembled in departments then taken to the NRC Clubhouse for pre-Christmas dispatch. Over 55 families had wonderful Christmases this year, thanks to the generosity of you and you and you.

Blue Ribbon Safety Gets Boost with New Racks



ACCENTUATE THE VERTICAL—Important safety feature and for added efficiency in material handling is the new rack storage system installed in the factory during holidays. Here General Foreman Wayne Morrison, Sheet Metal shop and Fabrication Operations Superintendent Roy Preuter check extrusion jobs cut to length, and ready for the Huffords. Vertical handling takes less space than former horizontal method, also eliminates head bumping hazard. Note other orders racked neatly in background.



ADJUSTABLE—New racks for flat stock and small sheet parts are built on adjustable "pegboard" design. Also racks have indexing feature so that they may be moved by mules and readily positioned on dollies. Here Mr. Morrison briefs Sheet Metal foremen, from left, Al "Ski" Siemianowski, Bert Fremgen, Bud Hawk, and Joe Schorle. Rack shown is used mainly for T-38, F-5 punch press runs.



STREAMLINED—Adding to shop efficiency is new job issuing system whereby newly cut parts (flat pieces on arms) and tools for each are loaded as unit and in sequence before delivery to punch press section. No extra handling now required to match part and tool. Bob Tatum, crib attendant; Lonnie Abbott, punch press operator; and John Lynn, foreman, compare notes as rack is loaded.

Best Wishes in Retirement



TO "LEISURE WORLD"—Matha Hicks, center with corsage, stalwart and ray of sunshine in 5707's Jig Board section, hung up her tools last week to call it a well-earned day and retire to her new home in "Leisure World," Seal Beach, California. But first department co-workers gave her a party with beautiful cakes plus a "going away" cash gift. From left, front row, Matha's well-wishers are Nancy Rector, Pearl Basinger, Geraldine Holloway, Gayle Ashton, Eleanor Craig, Opal Huguenot, Frances Ford, Lucille Kocker, Ella Burke, Kitty Boyle, and Mary Lemberger. From left, second row, Jean Prouty, Gladys Whitener, Joyce Sayers, Bert Hendrix, Juanita Bragman, Margaret Kennedy, Marion Stubbs, Marge Harvey, Evelyn Huisman, Josephine Wenner, Frances Yniguez, Irene Jones, Cleo Morrison, and Evelyn Barron. Third row, from left, Jerry Ralston, Irene Webster, Peggy Armijo, Leda Carrie, Alice Runser, Helen Smith, Karl Kiland, foreman; Dorothy Harris, Connie Rivas, Tom Duddleston, general foreman; and Dwight Stewart.

"Eye-lids"

(Continued from Page 1)

and Webb mechanics make about 100 inspections monthly.

Sergeant McMullin proposed to extend the life of the parts by cleaning both new and used leaves with a vapor blast, spraying them with a special silicon base lubricant and then baking them for four hours in an oven heated to 250 degrees F.

The first leaves treated according to Sergeant McMullin's formula have been operating for 360 hours without showing appreciable wear—nearly four times longer than their previous usable life. Until the parts begin to show wear, the full value of his idea cannot be assessed. But based on factors known at this time, officials foresee a possible savings of many thousands of dollars.

NORSIGHT TO BE MARKETING BY ILLINOIS FIRM

Norsight, a compact, lightweight, adjustable optical sight developed at Northrop Norair, has been licensed to Chicago Aerial Industries, Inc., Barrington, Illinois. The company will produce Norsight and market it worldwide.

Norsight is designed for use as a fire control aiming device in manned aircraft systems.

Utilizing a unique type of optics and light source, Norsight provides the following features: little or no instrument panel interference, adjustable by the pilot for delivery of other types of armament, easily operated with minimum obstruction of a pilot's forward visual field, ease of maintenance and maximum reliability due to a minimum of parts, versatility of mounting in all types of aircraft, and minimum weight (approximately 2.5 pounds).

Norsight contains two miniature, high intensity quartz lamps, one for back-up. Each is no larger than a pea and produces 25 watts for a rated lifetime of 500 hours.

Friend in Need



CHRISTMAS GIFT—Happy man is Byron A. "Curly" Pierce, inspector, Nondestructive Testing. The Los Angeles Red Cross called "Curly" to donate some of his rare type B positive blood for open heart surgery being performed on a six-year-old girl. He complied and latest advice is that the young lady is recovering satisfactorily, thank you. Said he, "I was fortunate to be able to help."



ROYALTY CHECK—Stan Peterson, Corporate Product Licensing, left, presents royalty check to Norsight inventors Don Herrick, Mechanical Design, and Bob Beam (now with North American). This two-man team shares patent honors for promising new compact lightweight adjustable optical sight recently licensed to Chicago Aerial Industries, Inc. Norsight is used for fire control aiming device in manned aircraft systems.



RIDES WANTED

8 a.m. — 4:45 p.m.

NATIONAL & SAWTELLE, Los Angeles, Lynne Miller, ext. 554, 555, 755-3805. 5
CRENSHAW BLVD. & 104TH, Inglewood, Gloris Skok, ext. 733, 673-1912. 5
PRAIRIE & REDONDO BEACH BLVD., Lawndale, Ruth Johns, ext. 4183, 370-1375. 5
FOOTHILL & ORO VISTA, Sunland, C. J. Dobbins, ext. 738, 353-4770. 5
COSTA MESA, Newport, Saxe Dobrin, ext. 1506, LI 8-2145. 5

RIDES OFFERED

8 a.m. — 4:45 p.m.

FOOTHILL & ORO VISTA, Sunland, C. J. Dobbins, ext. 738, 353-4770. 15
COSTA MESA, Newport, Saxe Dobrin, ext. 1506, LI 8-2145. 15

BBSF Classified Ads

BBSF classified ad service is provided free of charge to all Northrop Norair personnel.

Ads for agencies, commercial enterprises and private businesses are not accepted.

Deadline is noon Wednesday, one week before publication.

FOR SALE

MINK STOLE, natural sapphire, like new, \$450. DA 3-6641 after 5 p.m. A
T-BIRD, 1958 convert., new black top, p/steering & brakes, \$1495. GL 4-2057. A
RANGE, O'Keefe & Merritt, gas, auto, controls, chrome top & ariddle, \$95. DA 5-5245. A
OLDSMOBILE, 1952 sedan, r/h, new tires & engine, 1964 taas, \$225; platform rocker, maple arms, \$10. 675-0521. A
END TABLES, 2, maple, coffee table to match, \$50. OS 9-7058. A
PONTIAC, 1953, rebuilt trans., \$75. OS 6-6486. A
SECTIONAL, 4-pc., custom-made, \$275. DA 9-6848 after 5 p.m. A
PEUGEOT, 1959, r/h, sunroof, \$650 TE 3-9455. A
CHEVROLET, 1953, auto, trans., r/h, \$190; table, blonde, \$25; desk, 6-drwr., 54"x18", \$16; telephone table, small wood, \$4; typewriter table, portable, \$5; green blackboard, exec-size, metal-rimmed, \$6. 477-5957. A
FORD, 1952, V-8, 4-dr. sedan, r/h, 2 new w/w tires, recent tune-up, \$200 FA 8-1043. A
STOVE, O'Keefe & Merritt, 39", w/ chrome top & ariddle, \$50. OS 6-4272. A
MOVIE CAMERA, 8mm, Bell & Howell, elec. eye, w/3 fast f/1.8 lenses, speeds 10-40, \$69.95; Childcraft library, 15 vols., for children 5 to 13, colored illustrations, \$25. 398-7417. A
RACER, quarter midget, incl. McHal helmet, full race eng., \$450. TO 1-6404. A
FORD, 1960, 2-dr. h/top convert., full power, r/h, record player, \$1200; T-Bird 1957, full power, r/h, auto., \$2200. OS 5-9730. A
OLDSMOBILE 88, 1957, h/top 2-dr., r/h p/steering, new tires & trans., \$600 DA 3-6255 after 5 p.m. A
PIANO & bench, upright, \$150 or best offer. OS 6-6592. A
CHAINS for 8.00x14 or 7.10x15 tires, \$5; station wagon pad, deep cotton, \$10. FR 7-1807 after 6 p.m. A
BOWLING BALL, baas & shoes, ladies' size 6 1/2. \$25. TO 6-2022. A
PLYMOUTH, 1957, auto., 2-dr. h/top, \$250. 674-7997. A
RIFLES, 30-30 Winchester, model 94; Hinans, 22-cal., \$75. DA 3-2940. A
PONTIAC, 1954 4-dr. sedan, 1-owner, \$295. PL 1-0359. A
PATIO TABLE, redwood & 4 benches, \$15. 295-9097. A
REFRIGERATOR, Friadaire, \$35. AX 2-4958. A
FALCON, Sprint, 1963, V-8, 2-dr., r/h, 4-spd., \$2250. 323-1582 after 6 p.m. A
HOUSE, 3-bdrm., 1 bath, stucco, carpeting, walnut paneling, fireplace, acoustical tile, cinder-block wall, 2-car attach. garage, financing avail., \$21,500. FR 5-2844. A
RAMBLER, American, 1962, stick shift, heater, \$1250. FR 9-6604. A
STOVE, Tappan deluxe, gas, auto, controls, chrome oven, \$50. DA 3-8797. A
CHRYSLER Newport deluxe, 1956, p/steering & brakes, r/h, \$375. FR 7-1094. A
YAMAHA, 1963, 80cc, 2000 miles, 3-mo-old, \$300. FR 2-9418. A

FOR SALE

RANGE, Tappan, glass door oven, \$15. OR 7-5276. A
HEATERS, elec. portable, \$4.50; thermostat control, \$10. OS 5-7938. A
WASHER, GE auto., \$50; dryer, Norge elec., 110 or 220 volts, \$125 or best offer. VE 9-1726. A
CADILLAC, 1952, full power equip., \$250; TV, 17" Emerson, \$25; bicycle, 20", \$10. EX 8-5201. A
TELEVISION SETS, blonde cabinets, 10" Magnavox, table model, \$10; Admiral, 17" comb., AM-FM radio, 3-spd. Victrola, \$100 or best offer. EA 2-3757. A
VOLKSWAGEN, 1959 sedan, 1-owner, \$1100. 323-0180. A
BICYCLE, Schwinn, fully equipped, \$35. OS 6-2581. A
CORVAIR, Monza coupe, 1962, new tires, recent tune-up, 4-spd., stick, \$1700. OS 6-8738. A
SURFBOARD, 9' 6", sharp rudder tail, \$40. 837-0851 after 6 p.m. A
OVERHEAD CAMPER, 1960, 10' Silver Tower, butane ice box & stove, self-contained, \$1150 or make offer. DA 4-1719. A
VACUUM CLEANER, Kirby, all attach., \$85. OS 6-0913. A
ORGAN, Hammond spinet, walnut, \$750. 645-3878. A
TABLES, 2, mahogany finish, \$25. OS 6-8457 after 5 p.m. A
DUTCH DOOR, 30", glass in top section, w/hardware, \$12. GR 2-2352. A
STOVE, iron, antique-toy, wood-burning approx. 12"x5"x6", \$15. PL 4-8142. A
REFRIGERATOR, Coldspot, 10 cu. ft., white, cross-top freezer, \$40. FR 6-9173. A
BICYCLES, boy's & girl's, 26", \$15 for both. FR 5-8804. A
SAXOPHONE, Martin, B-flat tenor, w/ case, stand, strap, 3-yrs-old, \$300. FR 1-2698. A
BOWL-A-MATIC, w/auto. pin setter, \$10. OS 6-0666 after 4 p.m. A
OPEL, 1959 2-dr., 42,000 miles, \$335 or \$30 mo. TE 3-9430. A
MOTORCYCLE PARTS for Honda, muffler, seat rinas, carb., etc. \$20. 292-4044. A
BICYCLE, Schwinn-Continental, 10-spd., \$45; Mo-Ped, 1960 Allstate, \$95. OS 6-9667. A
DODGE, Custom Royal, 1957 4-dr. sedan, V-8, r/h, \$325. 789-1698, 451-3244. A
DOG HOUSE for med. size dog, \$10 645-2118. A
REFRIGERATOR, \$25; stove, gas, apt-size, \$15; bathtub, toilet, lavatory, \$35; chest-of-draws., \$3; entrance hood, alum., \$5; wall heater, 240-volt, \$3. OS 6-1018. A
HILLMAN, 1958 convt., \$480. PL 7-1903. A
SIMCA, station wagon, 1959, r/h, economical transportation, \$325. FR 5-7038. A
DISHWASHER, GE Mobilmaid, \$35. FA 1-1655. A
DODGE, V-8, 1956 4-dr., r/h, \$475. Box 2401. A
PADDLE BOARD, sailing-type, 12' long & 4' wide, 12"x9" sail, \$50. Box 2402. A
ORGAN, Hammond, mod. B-3, w/Leslie & Hammond ext. speakers, \$2000. DA 4-6260. A
DODGE, 1957 station wagon, r/h, auto trans., p/steering, new tires, \$600; bicycle, 20", \$7; kiddie tractor, \$3; hot rod, \$5. DA 9-5564. A
LARK, 1959 deluxe 6, auto., \$535. 754-0660. A
TRAILER, teardrop-type, complete w/ new innerspring mattress, tent, etc., \$250. FL 1-7187. A
POOL TABLE, 7', w/all equip., 1-yr-old, \$65. SP 2-1789. A
CADILLAC, 1951 Fleetwood, \$250; range, Kenmore elec., \$25; Stauffer table, \$75. OS 6-2162 after 4 p.m. A
FORD, Falcon, 1960 2-dr. sedan, r/h, auto, trans., new battery, \$775. 834-7589. A
CHEVROLET, 1955 convert., new top, paint & brakes, \$345. 296-1238. A
HI-FI EQUIPMENT, Jensen speaker, 7" woofer, 3" tweeter, Miller FM tuner, 30-w amplifier, 3-yrs-old, \$50 or best offer. FA 8-1054. A
DESK, roll top-type, solid oak, needs refinishing, \$20. FR 4-0021. A
DE SOTO, 1957, Sportsman Firedome eng., r/h, air conditioning, full power equip., \$650. 329-6407. A
REFRIGERATOR, Servel, gas, 9 cu. ft., 1951, new door seal, white, right-hand door, \$25. PL 6-1812. A
OSCILLOSCOPE, 7" Cathode Ray, RCA, \$80; VTVM, RCA, \$25; volt-ohmmeter, Phastron, \$20; signal generator, precision, \$30; TV alignment generator, Heathkit, \$18; TV bar generator, Heathkit, \$8; flyback transformer & yoke tester, EICO, \$10; power supply, 10-volt D.C. filter, Electro, \$10. 371-8701. A

WANTED TO BUY

CAMPER, 10' Tukaway or Alaskan, for pickup truck; accordion, professional model, full size w/elect. pickup, OS 6-8331. B
NASH, Metropolitan, late model convert. 374-8754. B

FOR TRADE

ACREAGE, 5, level, in Yucca Valley, trade as down payment on income property. DA 9-6039. C

RENTALS OFFERED

APT, 1-bdrm., custom decorated, subterranean parking, pvt. decks & pool, \$137.50. 326-0474. E
TRAILER, 15' camping-type, \$30 wk. FR 1-1787. E
APTS, 1 & 2 bdrm., carpets, drapes, built-ins, pvt. patios, near Crenshaw & Torrance Blvds., \$95 & \$125 mo. FR 5-0867. E
APT, 2-bdrm., furn. & unfurn., lae. pool & patio, all extras, closed aaraaes, near El Camino College, from \$115 mo. DA 9-5986, DA 3-1946. E
DUPLEX, 1 story, children & pets ok, range & refria. avail., fenced yard, \$70 mo. 679-8867. E
APT, 2 bdrm., 1 child ok, pool, \$100 mo. during winter; \$125 mo. summer. OS 5-2772 after 5 p.m. E
HOUSE, 3-bdrm., ocean view, aaraae, disp., w/w carpet, redecorated, \$150 mo. FR 4-3710. E
APT, 2-bdrm., w/w carpet, built-ins, disposal, drapes, aaraae, \$100 mo. OS 6-2501. E
APT, 1-bdrm., unfurn., refria. & stove optional, aaraae, \$80 mo. FR 6-5630. EA 2-0039. E
APT, 1-bdrm., furn., utilities paid, single person preferred, \$80 mo. OS 5-9695. E
APTS, 1 & 2-bdrm., 2-bath, built-ins, aaraae, aaraae disposal, dishwasher, carpets, drapes, metered washer & dryer, 2-bdrm., \$145 mo.; 1-bdrm., \$115 mo. FR 6-3654. E

PERSONAL

I WISH to express my deep appreciation to all my friends at Northrop for their messages of sympathy due to the loss of my beloved husband, Louie Baker. MRS. LOUIE BAKER. L
I WISH to thank NRC & my friends at Norair for the many kind wishes & get-well cards I received while I was in the hospital. HADLEY HUGHES. L

FOR SALE OR TRADE

STOVE, Friadaire, elec., 9-yrs-old, \$50; vacuum cleaner, Kirby, upright-type, w/attach., \$10 or trade one or both items for spinet piano in good condition. OS 5-1967. M
MOTOR, 2-hp Evinrude, used 4 hrs., \$75 or trade for tape recorder. DA 9-6728. M
KARMANN GHIA, 1961 convert., \$1500 or trade for Karmann Ghia h/top of similar quality. FR 5-3359. M

Girl Scouts At Gates to Sell Cookies

The NRC-sponsored Girl Scout Mariner ship will be selling cookies outside Gates 3, 5, and 16 and by the NSL lobby exit after school Friday, February 7, it has been announced by Dick Pryor, general supervisor, Personnel Activities.

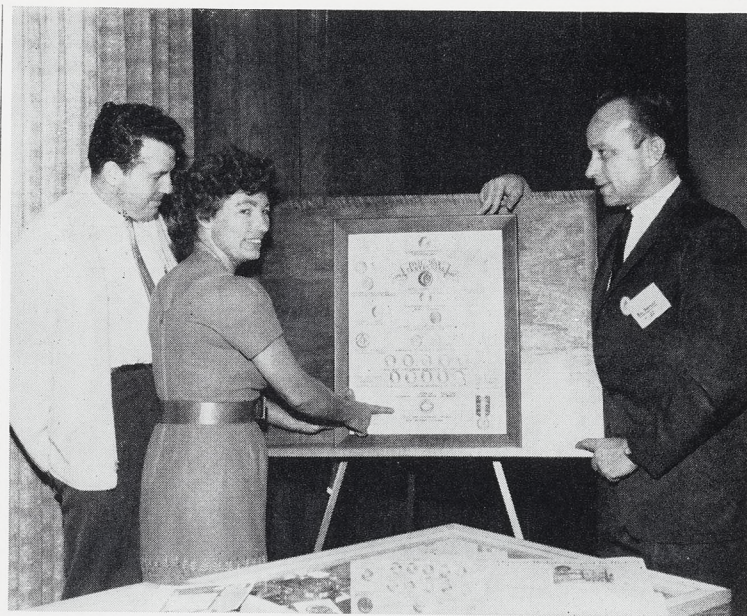
Proceeds from cookie sale will help the young ladies continue those fine canoe trips down the Colorado River.

Improvement

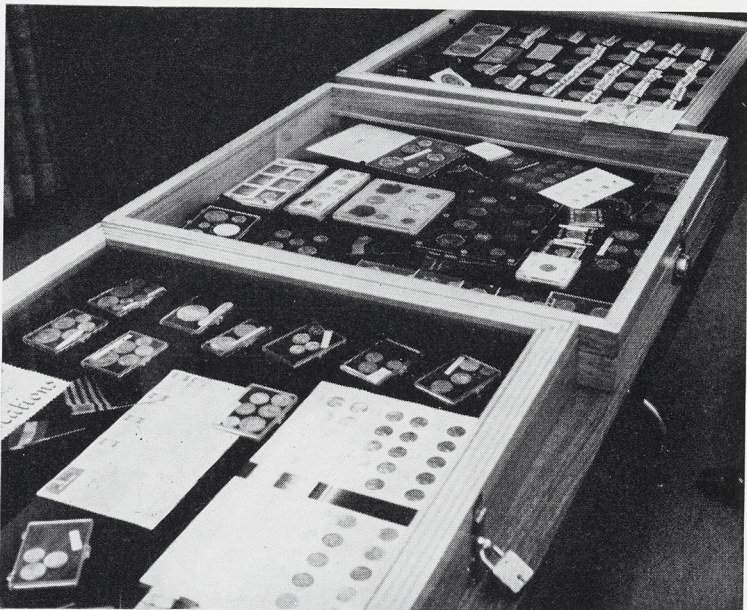
(Continued from Page 1)

Planning; Product Support, R. G. Bredeben, chief, Programs and Requirements; Quality Control, Jack Apodaca, budget analyst; Administration, W. L. Gillotti, project master planner; and Contracts and Pricing, Vinton Higbie, chief, Administrative group. Significant to the nationwide cost reduction program, the Northrop T-38 is playing a prominent part in two military films now being circulated throughout military establishments and the industry.

One is under the Department of Defense label and features Secretary of Defense Robert S. McNamara and his cost improvement message. The other is an Air Force Value Engineering film with an introduction by Secretary of the Air Force Eugene M. Zuckert. Both films carry the classical story of Value Engineering's part in the redesign of the T-38's hydraulic reservoir and serve to illustrate actual methods used by Norair's V-E teams in action. In addition, the Air Force



RICH COIN FARE—Mrs. Joy Parrish, recent lecturer before the NRC Coin Club displays her famous Civil War collection of tokens, medals, and trade dollars. At left is NRC president, Bernie Doyle. At right is William Schmidt, Coin Club commissioner.



MEETING HIGHLIGHT—Feature of the Coin Club's Joy Parrish lecture meeting were displays of rare and high-value items both U.S. and foreign. All Northrop personnel with numismatics in their veins are invited to join the Coin Club and participate in their activities. Coin collecting, as all the fraternity knows, is both educational and profitable. Professionals estimate that new mint issues double in value the first 10 years.

NRC Hikers and Packers To Hear Sierra Lectures

The NRC Hikers and Packers, Commissioner Bob Van Allen, are offered a series of eight lecture courses and three field trips

by the Los Angeles Chapter of the Sierra Club.

The program which is a basic mountaineering course is free of charge and open to anyone over 15 years of age. Younger children are welcome if accompanied by an adult.

The meetings will be held at Elysian Playground Clubhouse, 900 West Academy Road, overlooking Dodger Stadium. Time is 7:30 p.m.

Dates and subjects:

January 29, Mountain House-keeping: Equipment, Cooking, and Camping.

February 2, Equipment Show, 12 noon to 5 p.m.

February 5, Travel and Orientation.

February 12, Rock Climbing.

February 16, Rock Climbing-Field Trip.

February 19, Mountain Medicine.

February 26, Desert and Desert Survival.

March 4, Snow and Ice.

March 7 and 8, Ice Axe Practice—Field Trip.

March 11, Safety—The Climber and His Environment.

March 18, Mountaineering Movie.

April 11 and 12, Desert Backpack—Field Trip.

Those who wish to participate are asked to notify Personnel Activities.

Charm Series Offered by Jan Murdock

Tomorrow night, January 16, will be the last night to register for the NRC's new charm course, it is announced by Bernie Doyle, NRC president.

Jan Murdock, nationally known personality and lecturer, will present her "Three Steps to Charm" series beginning Friday evening, January 17, 7:30 to 9:30 p.m. at the NRC Clubhouse.

Teaching will include figure analysis, personality types, make-up tips, body coordination, wardrobe planning, accessorizing, shopping wisdom, and other topics of interest to working women.

film carries an exciting color sequence of T-38s flying in formation at high altitude with the lead airplane peeling off and heading for the lower regions.

Thousands of important aerospace people are scheduled to see the films within the next few months. Norair personnel can take justifiable pride.

NORTHROP NORAIR NEWS

Issued biweekly by Norair Division of Northrop Corporation

• Wednesday, January 29, 1964

HAWTHORNE

PALMDALE

EDWARDS AFB

SAN ANTONIO

F-5 FIGHTERS IN THE SKY



FORMATION FLIGHT — Striking photograph taken at Edwards Air Force Base, catches four F-5 fighters in formation over the high desert after supersonic low-level "close support" pass. Note that aircraft have full

load of arms aboard. F-5s are being produced on Norair's twin assembly lines for delivery to Military Assistance Program countries. System indoctrination and training is now underway at Williams Air Force Base.

PHIL BATH PHOTO

Our Pledge To President Johnson

To: All Northrop Personnel

In response to President Lyndon B. Johnson's request for strict economy in performance of all defense industry operations, I have written him to pledge "that the efforts of every individual associated with the Northrop Corporation will be directed with renewed emphasis to the achievement of high quality production at the lowest possible cost under all government contracts."

I am relying on every employee of Northrop Corporation to join me in the fulfillment of this pledge.

Thomas V. Jones
President and Chairman
Northrop Corporation

Major Med for Husbands Wives New Group Benefit

A new Northrop Group Insurance benefit especially designed for women employees has been announced by Corporate Senior Vice-president Robert R. Miller.

Effective March 1, 1964, the ladies may, at their own option, obtain major medical coverage for their husbands.

Cost of the plan initially will be \$1.35 a week via payroll deduction.

Major medical insurance pro-

vides participants with that extra protection needed when the big bills begin to roll in for serious sickness or injury—should we be so unfortunate.

"Major med" is based on the \$100 "out-of-pocket" provision. This means that when an individual's doctor or hospital expenses exceed \$100 within a period of 120 days or less, the plan will pay 80 per cent of all eligible

(Continued on Page 4)

NOLAN DESIGNATES FEBRUARY 'OPERATION ROUNDFILE' MONTH

Corporate Vice-president and Norair General Manager Dick Nolan gave President Johnson's government cost improvement program an additional boost last week by officially declaring February to be Operation Roundfile month.

Operation Roundfile is a yearly Division program which achieves substantial economies by reducing paper costs. Goal for the current year is to exceed 1963 savings figure which amounted to over \$125,000. Savings accumulate from reduction in quantities of forms, reports, records, manuals, memos and various other types of paper.

Operation Roundfile is described in detail in a brochure to be distributed throughout all organizations. Included are formulae for calculating savings. Example: if an official form printed by a vendor-printer, is obsolete and not replaced, annual savings can be \$2000 or more.

The Northrop Norair Cost and Management Improvement program coordinators have been

MAD, MAD, MAD, IN EXCLUSIVE FOR NORTHROP

Personnel Activities and the Northrop Recreation Club announce an exclusive showing of "It's a Mad, Mad, Mad, Mad World" for personnel and guests on February 16.

Tickets will be \$2.75 loges; \$2.50 for orchestra; and with the first four rows going at \$2.25. These are available now. Repeat, now.

Parking is 50 cents with a special discount coupon which accompanies the ticket.

Time is 7:30 p.m.

It's a Mad, Mad, Mad, Mad World, which is showing at Pacific Cinerama, 6360 Sunset Boulevard, as everyone knows, bids to be the tops in entertainment for the sixties.

designated as a committee for Operation Roundfile. Chairman is Leo Richman, chief, Records Management. Committee members will guide paperwork reduction efforts in their various departments.

Members include:

W. L. "Sparky" Sparks, Management Research, Division coordinator.

Vint Higbie, Contracts and Pricing.

R. G. Bredesen, Product Support.

E. R. Foord, Product Support alternate.

C. Goodman-Malamuth, Manufacturing-Materiel.

Kurt Reif, Manufacturing-Materiel alternate.

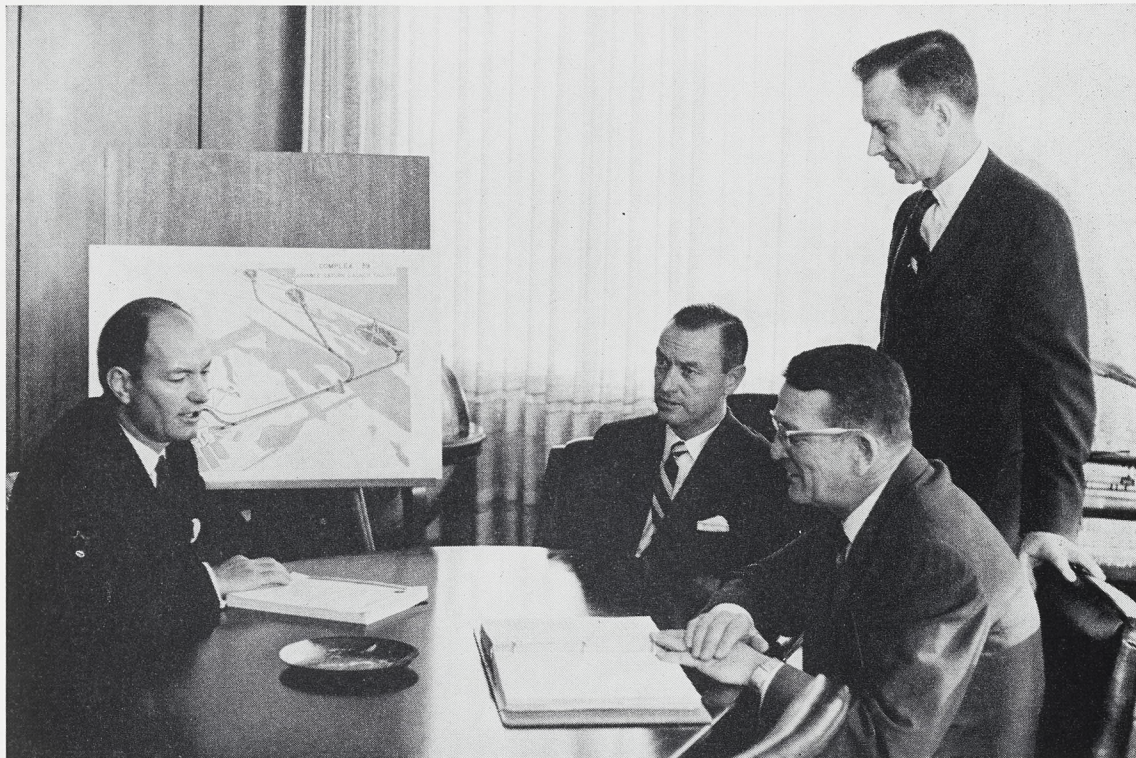
Ted Hamlet, Technical.

Isabelle Ainge, Technical alternate.

Jack Apodaca, Quality Control.

Jack Meyer, Finance.
Bill Gillotti, Administration.

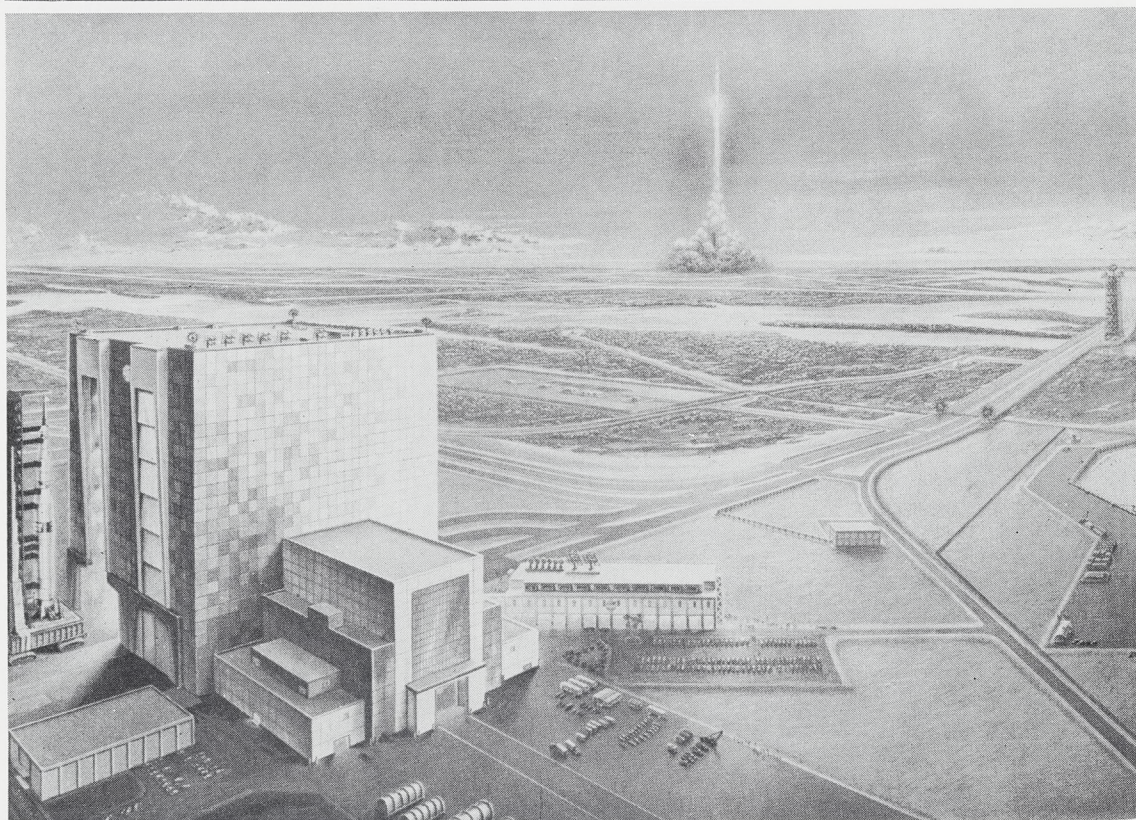
MILA TEAM IN HOMESTRETCH DRIVE



MANAGEMENT DECISION—Northrop top officials, from left, Dr. Wm. F. Ballhaus, executive vice-president; Thomas V. Jones, Northrop president and chairman of the board; Dick Nolan, Corporate vice-president and Norair general manager; and, standing, Richard E. Horner, senior vice-president and Northrop Space Laboratories general manager, review first draft of Company proposal for launch support services at the John F. Kennedy Space Center. Drawing on easel depicts principal area of activity, Complex 39, where giant Saturn boosters will hurl Apollo lunar capsules to the moon. For their comments on MILA work, see adjoining.



EXPERIENCE — Important factor, as always, is capability and hard-won related experience which fits competing companies for space work assignments. Photo at left is prairie excavation scene from Titan SM-68 Squadron site, Rapid City, South Dakota, where as subcontractor to Martin-Marietta, Northrop performed support services for more than 9000 personnel plus installation and check-out of Martin supplied equipment. Preparations under way in photo were for underground missile silos. Job is now complete.



COMPLEX 39—Artist's drawing shows VAB (Vertical Assembly Building) in foreground. It is the largest building in the world. Note Saturn V at left entering through door 45 stories high. Missiles are assembled here in upright position. They are then moved to pads near beach on huge crawlers. Northrop's proposal seeks launch support services for this area. Completion is scheduled for 1966. It will be a modern-day "Palos" where voyagers depart for unknown space frontiers.

MEN WHO "WROTE THE BOOK" IN COMPETITION FOR SPACE WORK

Those red, white and blue badges Division people are wearing, like during election campaign times, that say "Win MILA Launch Support", mean you are a member of the team.

But not just an everyday team. The Merritt Island proposal team; a tightly knit group of long experience types bent on doing everything they possibly can to bring Northrop in a winner in the launch support services competition now going on at NASA.

The MILA stakes are high, many millions of dollars in the long term. The responsibility is also high, that of performing key

Schirra, Slayton, Grissom, and other men not yet known but with destiny's hand already on their shoulders.

Right now at Merritt Island feverish activity is underway to prepare the country for this great undertaking, and Northrop's talents and long record of success in field operations place the Company in a position to contend for a varsity spot on this bigger team, Uncle Sam's front line in the space effort.

Imagine a building taller than the L.A. City Hall, equal to 52 stories in fact; in cubic area bigger by half that of the Pentagon,

By Aerospace Reporter

tasks in safely placing men in space, rocketing them to the moon, to the planets.

IN OUR TIME

Merritt Island will soon be a household word throughout America, indeed the world. A place where big headlines are born. It will be a twentieth-century Palos where brave voyagers will embark for the unknown. It will be to space in our time what St. Louis once was to the new west, a jumping off place for exploration of far frontiers.

Merritt Island will have its own "Seven Fabulous Cities of Cibola," the Planets Mars, Jupiter, Venus, Saturn—

There will be new heroes in the history books. Columbus, Magellan, Hudson, Raleigh, Cabot, and John Smith, will live again in modern counterparts—Carpenter,

where four at a time and in upright position, the mighty Saturn/Apollo will be assembled for launch. VAB, for vertical assembly building, will be the biggest building in the world.

The Saturn vehicle itself is no less fantastic. C-5, which will hurl the Apollo to the moon with its three stages tower 280 feet in the air. That's eighty feet higher than the very tallest oil derrick we see in Signal Hill. With a first stage thrust of 7.5 million pounds it will send a hundred tons into low earth orbit. It will boost 90,000 pounds to escape velocity—that is 45 tons, a big boxcar load if we need a reference.

NASA's Merritt Island is a giant undertaking.

Completion of VAB is due for 1966. The combine of construction giants; Morrison-Knudsen,

MANAGEMENT QUOTES ON MILA

THOMAS V. JONES, president and chairman of the board: "Northrop's decision to become a contender for the launch support services contract soon to be awarded by NASA at Merritt Island is predicated on our prover: ability to perform such tasks. If successful we will pledge utilization of the total Corporate resources—in people, in organization, and in technical know-how—to satisfy the requirements of the job . . . A very important assignment . . . In the front line of the nation's space programs."

DR. WM. F. BALLHAUS, executive vice-president: "In space work capability must necessarily be a pre-demonstrated fact. Before entering the MILA competition, your management made a thoughtful appraisal of people and weighed the records of accomplishment. All answers to the question of our management and technical ability, our establishment, our financial integrity were affirmative. Our history of getting along with other people and with unbroken industrial harmony in our own shop, were strong yes factors. There were no negative elements . . . We are convinced of our ability to do the job at Cape Kennedy."

RICHARD E. HORNER, senior vice-president and Northrop Space Laboratories general manager: "The MILA contract is a technical challenge in the most advanced degree. To be selected by NASA for support services at the nation's launch facilities in lunar operations and deep space penetration would be an exacting responsibility. Our space contributions to date, headed by Northrop Ventura's recovery systems—100 per cent reliability, no failures—have given all personnel intense satisfaction. MILA would add a distinguished chapter to the record."

DICK NOLAN, Corporate vice-president and Norair general manager: "MILA is an extremely important field operation, one that requires precision planning, farsighted concepts and personnel with durability in their makeup. The proposal activity is managed and staffed by Northrop people with successful records in site undertakings. This same team, backed up in the space specialties and rare skills by all Northrop divisions, stands ready should we receive the NASA assignment. I wish to compliment H. E. Herdrich, manager, Site Activation and Field Operations department, and L. H. Brennwald, proposal manager for MILA, for formulating a sound and realistic program, one in which customer satisfaction is the first consideration."

Perini, and Paul Hardeman was low bidder trio at \$63.3 million to outfit and equip the immense "hangar." Foundation steel, design of construction were handled by other contractors. Total cost will be \$100 million.

Contracts for over \$400 million were awarded during 1963 to bring the NASA John F. Kennedy Space Center to its present status.

OUR TARGET

Just what is Northrop's contract target at the John F. Kennedy Space Center?

Northrop is contending for the type of work it knows how to do best. Our management feels that the Company is a particularly strong contender for the launch support services contract, proposals for which are due in at Cocoa Beach on or before 3 p.m., February 5.

Specifically the work entailed in the award will be for:

- Launch Complex 39 operation.
- Engineering support services.
- Technical shop operations.
- Materials cleaning and test services.
- Converter-compressor facility operations.
- Ordnance storage and check-out.
- Propellant services.

WROTE THE BOOK

Northrop's history of accomplishment in field operations is long, much of it in the pioneering category. "Writing the book." The Company was the first contractor on site at Edwards AFB then called Muroc Army Air Force Base. Also at Edwards, Northrop designed and activated the famous track and sled facility which carried Colonel Stapp at 632 miles an hour. Human acceleration tests there paved the way for Carpenter and Glenn to ride the big boosters in their first space flights. Northrop was one of the first at the Air Force Missile Development Center, Holloman Air Force Base where 22 launches were performed with the N-25 missile, forerunner of the Snark.

One of the first long range instrumentation and tracking ranges was the product of Northrop development, a controlled air corridor stretching from Santa Barbara, California to Shreveport, Louisiana. The range was used in celestial guidance

system work.

Northrop's record at Cape Canaveral, now Cape Kennedy, is one that paced the advance of the great complex itself for our launch crews were there before the Air Force test range was operational. These same crews, many of whom are now engaged in the MILA proposal, helped develop the range to Ascension Island, 5000 miles away. As systems manager of the SM-62 Snark weapon system, we were first to use the range. Ninety missiles were launched in the eight-year program.

As a prime weapon contractor, Northrop was the first at Presque Isle AFB in Maine. Northrop men prepared conceptual drawings and specifications for A & E and maintained surveillance over site construction, contracted and managed the subcontractor installation of equipment and performed checkout and integration.

Most recently the Company completed a turnkey assignment as subcontractor to Martin for the SM-68 Titan Squadron at Ellsworth AFB, South Dakota where the Company performed installation and checkout of all Martin equipment and provided support for 9000 Martin and associated contractor personnel.

A word about service team personnel.

They are very special people as their record shows with theatres of action from the desert sands of the Mojave in our own backyard to the ice mountains of Thule, 1000 miles from the North Pole.

Northrop Field Operations people thrive on the unpredictable. Mr. Nolan states, "They (Field Operations personnel) seem to work best under the paralyzing demands for ingenuity and energy that offsite environments periodically impose."

The MILA team during their months-long seven-days-a-week dedication to the preparation of the Merritt Island proposal has done its work well. We have Mr. Nolan's word for it. And with esprit de corps. The red, white and blue badges testify to this.

Could it be that a return to the Cape would be sort of homecoming for many of these men who countless times watched the fiery tailpipes of the Snark disappear over the Atlantic? Could this pos-



MILA PROPOSAL AREA—Here, in exclusive location in Crenshaw plant, MILA proposal men and women concentrate on presenting Northrop qualifications in bid for launch support services at John F. Kennedy Space Center, NASA. In preparation for many months, and with all capabilities, talents, and experience carefully listed, the pace nonetheless builds up as February 5 deadline nears. Team knows that competition will be exceptionally keen.

sibly account for some of the spontaneity of the team? Undoubtedly.

Moon landings, reaching out to Mars and Venus, are enough to fire the blood of any Field Operations man. Even types who in the earlier missile days helped beep B-45's over Santiago and San Francisco Peaks on the way to Shreveport.

Lou Brennwald and his men are not the kind who would turn aside from technical challenges such as mark the NASA job.

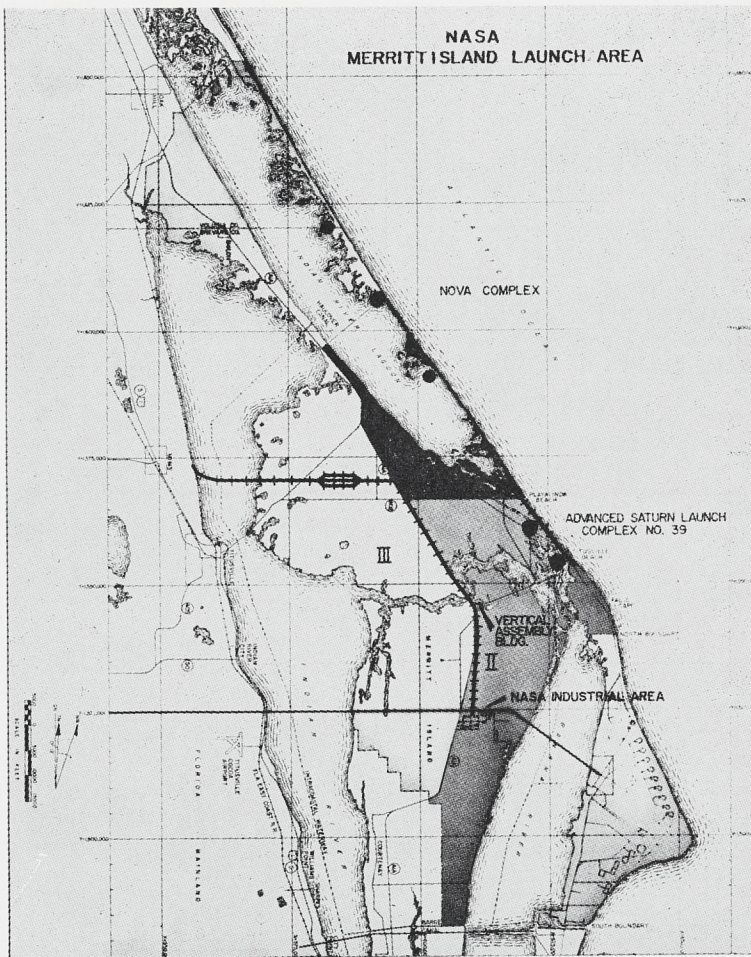
Whatever the outcome, the competition will know there has been competition.

Aerospace Reporter and all faithful News readers join in cheering the MILA boys down the homestretch.

We think we have a NASA winner.

We know we have the best outfit.

MERRITT ISLAND—Note location of Complex 39. Banana River, which lent its exotic name to the Center initially, is lower right. It is from this "space port" that American astronauts will take off for the moon.



Key Men on MILA

H. E. "Hap" Herdrich, manager, Site Activation and Field Operations department . . . Fifteen-year man. Company specialist in work performed in the field . . . Was key management man at Rapid City. Served as program administrator for SM-62 Snark.



Louis H. Brennwald, MILA proposal manager. First with Northrop in 1948. Is presently director of Test and Operations, NSL . . . Helped "write the book" on missile guidance and controls at Cape Kennedy . . . Holds B.S. in electrical engineering, University of California.



Charles W. Whiting, advanced program integrator. With Northrop 13 years . . . Has been site activation coordinator, missile test specialist plus data analyst and instrumentation duties at missile test facilities, Cape Kennedy and Holloman . . . Engineering degree from Northrop Institute.



A. H. "Andy" Anderson, MILA Pricing Proposal. A 22-year Northrop man . . . Recently engaged in T-38 and R&D administration and contract activities. Holds degree in business, University of Utah. Special studies at University of Southern California and Johns Hopkins.



Paul M. Stevens, MILA Technical Proposal, being responsible for development and integration of technical volumes. Was assistant project engineer on the Snark. Was with Aeronutronics on Atlas, Titan, and Shillelagh as manager of reliability. Degree in mechanical engineering.



Gayle A. York, program development engineer for Field Operations. Is a 23-year plus Northrop man specializing in engineering proposals and program integration phases . . . He was project engineer on the Titan T-2 Site at Rapid City. Was on the SM-62 weapon system program . . . Is a registered mechanical engineer.



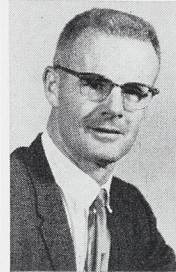
Robert S. Reed, manager, Major Subcontract Marketing. Is a 13-year Northrop man . . . Has many years service in contract administration, methods engineering, industrial engineering, and manufacturing . . . Bachelor of law from University of Michigan. Engineering work at Convair and Lockheed.



Herman D. McDonald, director, Corporate district office, Cape Kennedy . . . An 11-year man. Is presently the Company's technical man for the area in Florida for NASA and USAF. Holds bachelor of science in aeronautical engineering from Mississippi. Has long-time experience in missile flight test work.



John D. "Doug" Knox, executive assistant, Field Operations office. First with Northrop in 1943 . . . Has long experience in engineering design and administration duties on Company missile projects. Holds degree in engineering from University of Oklahoma. Was engineering liaison at Marquardt.



Russell Sells, staff to Mr. Brennwald. With Northrop since 1958. Is MILA specialist for organization and coordination of proposal details. Formulated system test requirements on the NSL Ranger program and was engineering supervisor, site activation, Rapid City. Was senior engineer, Field Ops and flight test at Norair.





RIDES WANTED

7 a.m. — 3:45 p.m.

WOODMAN & OXNARD, Van Nuys, Eleanor Reeves, ext. 1332, ST 0-6847. 2
MANCHESTER & AIRPORT BLVD., Los Angeles, K. B. Jamison, ext. 670, OR 1-3557. 2

7:30 a.m. — 4:15 p.m.

HAWTHORNE BLVD. & 190TH, Torrance, Betty Coats, ext. 1621, FR 4-2880. 3

8 a.m. — 4:45 p.m.

NATIONAL & SAWTELLE, Los Angeles, Lynne Miller, ext. 554. 555. 755-3805. 5
CRENSHAW & 104TH, Inglewood, Louise T. McCulloch, ext. 4074. 672-2434. 5

LA BREA AVE. & 64TH ST. OR EUCALYPTUS & FAIRVIEW, Inglewood, Louise T. McCulloch, ext. 4074. 672-2434. 5
CARSON & AVALON, Torrance, Need ride evenings approx. 3 nights a week for 3 months. Violet Neuhoft, ext. 2753, TE 5-3547. 5

RIDES OFFERED

7 a.m. — 3:45 p.m.

MANCHESTER & AIRPORT BLVD., Los Angeles, K. B. Jamison, ext. 670, OR 1-3557. 12

BBSF Classified Ads

BBSF classified ad service is provided free of charge to all Northrop Norair personnel.

Ads for agencies, commercial enterprises and private businesses are not accepted.

Deadline is noon Wednesday, one week before publication.

FOR SALE

STOVE, full-size, O'Keefe & Merritt, aas, 3-yr-old, \$40. FR 6-5630. A
OLDSMOBILE 88, 1957, 4-dr., p/s, p/b, new brakes & int., \$495; stove, elec., full-size, \$75. 326-8756. A

DISHWASHER, 1963 Sears 600, port., \$115; cooler, evaporative-type, \$65; power mower, rotary, \$40. OS 5-6430. A

DRYER, 220-volt, Westinghouse elec., \$45. GR 2-2818. A

BUICK, 1956 4-dr., \$225. FR 4-4953. A
PONTIAC, 1959 4-dr., Catalina, h/top, p/s & p/b, r/h, w/s/w, \$1350. OS 6-3776 after 4:15 p.m. & weekends. A

FORD, 1959 2-dr. Victoria, Fordomatic, p/s, \$700. OS 5-8278. A

SAILBOAT, 13' fiberglass sloop, dacron sails, \$425. OS 6-8663. A

SKI BOAT, 16' inbd. w/trailer & access., \$400; Chevrolet, 1956 Bel Air, 4-dr., 6-cyl., standard shift, \$495. FA 8-4188. A

BOAT, 13' flat-bottom wooden, \$35. FR 1-2166. A

CORVAIR, 1962, 700 Deluxe, stick shift, good tires, \$1150. 377-5936. A

OLDSMOBILE, 1958 Starfire convert., all power, \$750. DA 4-4845. A

HILLMAN MINX, 1960 sedan, r/h, floor shift, 34,000 miles, \$595. OR 1-3283. A

DINETTE TABLE, 4 chairs, \$20; bicycle, boy's 26", \$10. OS 6-2597. A

WASHER-DRYER, Bendix comb., aas, \$125; reverberation unit, \$30. FR 8-3990. A

SEWING MACHINE, Bernina port., zig-zag, \$30; crib & mattress, \$12.50. NE 8-3836. A

MERCURY, 1949 2-dr. coupe, floor shift conversion, elec. fuel pump, chrome dash, \$150. OR 2-3678 after 5 p.m. A

RAMBLER, station wagon, 1959 Cross Country Super, 6-cyl., 4-dr., auto. trans., r/h, w/s/w, seat belts, \$975 or best offer. CH 8-4370. A

MERCURY, 1955, power equip., ena. o/hauled recently. \$500. DA 6-3720. A

NORTHROP NORAIR NEWS

VOL. 21 NO. 25

3901 W. Broadway, Hawthorne, Calif. 90250

A NORTHROP CORPORATION
PUBLICATION
NORAIR DIVISION
Published every other Wednesday

CHARLES BRADFORD, Editor

Permission to publish material with credit to Northrop Norair News will be granted. News office extension—2456
Outside lines—678-9111, OS 5-4611.

FOR SALE

METAL DETECTOR, Gardiner model, w/ headphones & meter. \$50. 828-7873 after 5 p.m. A

REFRIGERATOR, 14 cu. ft., Servel, aas, \$50. 378-5924. A

MOVIE EQUIPMENT, radiant screen, 30"x40" leader model QB; projector 8-mm Kodak-Brownie 300; camera, Kodak-Brownie; light beam bar, Mov-E-Lite, \$100. 757-6960. A

ROAD RACE SET, Marx, elec., 93 pcs., \$17.50. FR 9-0952. A

STOVE, Gaffers & Sattler, 30", \$75. 323-2754. A

RADIO-PHONO COMB., Magnavox chair-side, 3-sp. phono, AM radio, amplifier, 15-watt, mahogany, console, \$35. CR 6-4879. A

ORGAN, Conn Minuet, 2-manual electronic, ebony finish, \$750. FR 5-7604. A

RADIO, AM-FM, table model, Silvertone, \$20; record player, Webcor, port., 3-sp., auto., \$25; fur coat, dyed squirrel Locke, brown, size 16, \$75; bookcase, dble. glass doors, light oak, \$20. FA 0-2862. A

CORVAIR MONZA, 1962, 4-sp., near new tires, bucket seats, r/h, w/s/w, \$1500 or best offer. 679-8398. A

CHEVROLET, 1955 convert, low mileage, new top, paint & brakes, \$345 or best offer. 296-1238. A

WASHER, Maytag auto., 1954, \$25. OR 1-0018. A

LINCOLN, 1956 2-dr. h/top, r/h, full power, new tires, \$600. FR 2-8843. A

CHRYSLER, Newport, 1955, r/h, all power, \$215. 676-5293. A

DINETTE SET, bronze-tone, 7-pc., Nevada top, \$20. 398-1458. A

BICYCLE, girl's 26", \$7. 377-3858. A

PLYMOUTH, 1955, auto. trans., 2-dr. h/top, r/h, recent tune-up, 4 new tires, \$395 or make offer. OS 9-5456, 675-2292. A

BUSINESS BOOKS, Alexander Hamilton, 24 vols. w/audes, lectures & problems, \$75. 675-9210. A

PUPS, Samoyed AKC reg., 9-wks-old, male or female, \$100. ME 4-4649. A

DINING SET, mahogany table, drop leaf & 6 matching chairs, \$110. 295-9997 evenings. A

AIR CONDITIONER, deluxe Fedders, for window or wall, 2-ton, 220-volt, used 1-yr., orig. cost \$500, \$275. AX 4-4478 A

BUICK, Riviera Roadmaster, 1955, orig. owner, full power, new brakes & drums, \$275. FA 1-0020. A

MOTOR, elec., 110-v AC, 1/6-hp, \$5; toolbox, 7-draw, Kennedy, key lock, \$12; helmet, welder-type, lift-front glass-holder, \$3. FA 1-2848. A

DINING TABLE, 6 chairs, grey & chrome, \$25; range, Kenmore, aas, timer, clock & glass door, \$25; pickup, 1953 Ford 1/2-ton, 1957 T-Bird ena., \$300. 675-5643. A

PICKUP w/camper, 1/2-ton, anti-smog device incl., \$895. DA 9-4675. A

TIRE CHAINS, 800x14, adjustable, \$7.50; hedge shears, elec., \$7.50; step ladder, 4', \$2.50. VE 9-6638. A

MOTORCYCLE, Matchless, 1959, 650 cc, \$600; outboard motor, Elgin, 7.5 hp, \$30. OR 1-1460. A

FORD, 1952, V-8, 4-dr. sedan, r/h, 2 new w/w tires, recent tune-up, \$175. FA 8-1043. A

POODLE, male, 2-yr-old, has shots, white w/don house, \$40. FA 8-5581. A

FORMAL DRESSES, 2 full-length, size 12, one green, \$5; beise & gold, \$10. EA 2-4747 after 5:30 p.m. A

HO TRAIL LAYOUT & table, \$25; bicycle, Schwinn Superior, 15-snd., \$85; Ford 1956 Tudor, 6-cyl., \$300; beer box, homemade, draught-type, \$125; refrigerator, beer tap, compl., \$89. 371-6775 after 5:30 p.m. A

TV, 24", blonde console, \$15; refrigerator, 8 cu. ft., \$30. DA 3-6730. A

DOG HOUSE, weatherproof, for med-size dog, easily moved, \$10; parakeet cage, \$5. 645-2118. A

HONDA, 1962, 1680 miles, 50 cc., battery start, luqaqaa baas & carrier, lae, sprocket for conversion to trail bike, \$200. VE 9-9565. A

DERAILLEUR, 10-sp., gold paint, lightweight, \$70 or best offer. FR 7-5075. A

REFRIGERATOR, Philco, 8.5 cu. ft., \$20. PL 4-5358. A

REFRIGERATOR, Frigidaire, \$35. AX 2-4958. A

HI-FI SPEAKER SYSTEM, Heathkit SS2, speakers in walnut enclosure, \$25. 371-7880. A

HOUSE, 3-bdrm., 1 1/2-bath, built-in range & dishwasher, water softener, good carpeting, cinder block fence, \$22,500. OS 6-0782 evenings. A

BOAT, 16' Glasspar, MK58A Mercury motor, aator tilt trailer w/spare wheel & tire, cover, life jackets, ski equip., \$995. 831-9707. A

WANTED TO BUY

PIANO, spinet, in good condition or priced low enough to be worth repairing. OS 5-1967. B

GUITAR, Fender Stratocaster w/tremolo & case, OS 5-7410. B

RENTALS OFFERED

APT, deluxe, around floor, 2-bdrm., 2-bath, built-ins, extra lae., \$125 mo. FR 9-8337. E

RENTALS OFFERED

APT, new, 3-bdrm., built-ins, 1 1/2 baths, fireplace, carpets & drapes, lae. patio & pvt. aaraaq, near Northrop, children ok. \$165. OS 5-7938. E

GUEST HOUSE, 2-room, furn., \$55 mo. Box 2501. E

HOUSE, 3-bdrm., 1 1/2-bath, built-ins, carpets, near schools & Harbor Fwy., \$160 mo. DA 4-9079 after 5:30 p.m. E

APT, 2-room bachelor-type, furn., 3 blks. to beach, \$75 w/utilities. FR 2-7406, FR 4-0602. E

APT, 1-bdrm., unfurn., utilities pd., \$78 mo.; room w/pvt. entrance & bath, \$10 wk. OR 2-4808. E

HOUSE, split-level, 3-bdrm., in Redondo Beach, 1 mile to ocean, built-ins, 1 1/2 baths, dble. aaraaq, \$150 mo. 374-2433 evenings & weekends. E

APT, 1-bdrm., custom decorated, subterranean parking, pvt. decks & pool, \$137.50. 326-0474. E

APTS, 1 & 2 bdrm., carpets, drapes, built-ins, pvt. patios, closed aaraaq, near Torrance Blvd. & Arlinaton, \$95 & \$125 mo. FR 5-0867. E

CABINS at Big Bear Lake w/fireplaces, kitchen & bath facilities, for 3, \$10 night; for 8, \$20 night. 714-539-6203. E

APTS, 2-bdrm., furn. & unfurn., lae. pool & patio, all extras, closed aaraaq, near El Camino Col. from \$115 mo. DA 9-5986. DA 3-1946. E

HOUSE, 2-bdrm., den, unfurn., close to schools, 2 children ok, Redondo Beach area, \$110 mo. FR 9-9735. E

APT, 1-bdrm., furn., utilities pd., drapes, disposal, metered washer & dryer, 1 mile from Northrop, \$80 mo. OS 5-9695. E

APT, 1-bdrm., furn., 2-bdrm., unfurn., sundeck, pvt. patio, all elec. built-ins, carpets & drapes, washer & dryer, aaraaq, in Torrance, 1-bdrm., \$120; 2-bdrm., \$140. OR 7-0847. E

DUPLEX, 2-bdrm., children ok, water & trash pd., \$90 mo. 679-7584. E

HOME, 2-bdrm., dining area, fireplace, built-ins, dble. aaraaq, occupancy Feb. 3, Manhattan Beach, \$135 mo. DA 4-7059. A

HOME, 4-bdrm., furn., built-ins, fireplace, patio, college grad. to share w/3 others, N. Redondo Beach, \$70. 379-4035 after 5:30 p.m. E

APT, new 2-bdrm., unfurn., 1 1/2 baths, colored fixtures h/wood floors, disposal, encl. yard, children over 14, 10 min. to Northrop, \$99.50. PL 5-0630. E

DUPLEX 1-story, children & pets ok, range & refria. avail., fenced yard, on Rosecrans Blvd. near Aviation Blvd., \$70 mo. 679-8867. E

PERSONAL

I WISH to thank all my friends who were so kind & thoughtful during my recent hospitalization & illness. VINCENT FINNEGAN. I

I WISH to express my appreciation to NRC, to Sports Car Club & to my many friends for the cards & flowers I received during my recent hospitalization. I AM MINSTER. I

FOR SALE OR TRADE

DEEP FREEZE, 22 cu. ft., \$250 or trade for outbd. ena., Johnson or Evinrude, 35-hp. FR 8-2609. M

CHILDCRAFT LIBRARY, 15 vols., for children 6 to 13, color illust., \$25 or trade for washing machine, auto., in good condition, will pay balance if necessary. 398-7417. M

Major Med

(Continued from Page 1)

costs for the rest of the year. There is an overall maximum of \$10,000.

If, however, your husband is covered by Group Insurance through his employer, the plan will only cover the charges over and above what his group insurance pays.

A booklet explaining the coverage in detail together with a memorandum from Dick Nolan, Corporate vice-president and Norair general manager, plus the necessary sign-up card will accompany all paychecks for women received this coming Friday, January 31.

Coverage for the husband will go in force without a doctor's examination providing the wife signs the application form and deposits it at the Norair Plant One Personnel office, Zone 10, by 4:30 p.m., February 28, a Friday.

If the deadline is missed, the husband will be required to undergo a medical examination before coverage is issued. The new benefit will be offered to all new female starts at the time of hire.

Next Bloodbank Set for February, 500 is Quota

The next Northrop blood bank date is set for February 19, it is announced by Dick Pryor, general supervisor, Personnel Activities.

The bloodmobile will be located at the Product Display Building from 7:30 a.m. to 12:30 p.m. for day shift donors and

from 4:30 to 9:30 p.m. for night shift.

Quota this time is 500 pints.

Organizations are advised that timekeepers will provide charge numbers in order that all signups may keep their appointments. Organization clerks and secretaries have donor applications. Forms are also available at Personnel Activities, or donors can use the one at the bottom of this page.

Transportation arrangements have been made from the Plant One main lobby, Plant Two main lobby, the Engineering Science Center, and the Plant Three cafeteria. Pick up stations for night shift personnel will be at Personnel Activities, Plant One, Plant Two main lobby and the east end of the radar hangar, Plant Three.

Dinner Meet Planned by Secretaries

Northrop secretaries are looking forward to February 13 for this will be the 1964 edition of the Airborne Chapter National Secretaries executive night dinner with a south-of-the-border theme.

The special event will be held at the Airport Marina Hotel.

Marjorie Stevens, secretary to Dick Beck, director, Manufacturing Engineering, and general chairman of the Chapter, met recently at the LaRonda Restaurant for a preview of entertainment to be offered. Virginia Kirk, secretary to Colonel Victor Anderson and Colonel Victor Cherbak of Corporate Development Planning, and entertainment chairman has signed Ben and Maria Cruz and their gay entertainers of Old Mexico, an entourage calculated to please the "boss." Of course there will be palate-pleasing food and guest gifts, to go with.

Other secretaries active in the affair are Pat Carlberg, secretary to Paul Wierk, director, Technical Administration; Mayme Colombo, secretary to Jack Mannion, manager, Manufacturing; Edna Parker, secretary to D. L. Lewis, Nortronics treasurer; Jeri Lippert, secretary to F. W. Lloyd, vice-president and assistant general manager, Operations; and Mattie Sherburne, secretary to Robert Elder, director, Flight Operations.

E-Z SHORTHAND FEBRUARY 10

Personnel Activities, in cooperation with Education and Training has announced another series of E-Z Speedy shorthand instruction to begin Monday, February 10.

Location will be the Plant One cafeteria with classes to be held on Mondays and Thursdays from 5:15 to 7:15 p.m.

Total cost is \$3 a person which includes textbooks and materials.

Enrollment is now under way at Personnel Activities, extension 2784.

TENNIS TEAMS MAKE GOOD IN LEAGUE PLAY

Northrop NRC tennis teams have proved to be tough competition in league play this year.

Both "C" and "D" teams were entered in mid-cities play going up against South Bay aggregations.

Our "Cs," skippered by Al Tennant, NSL, captured their division title while the "Ds," Captain John Meyer, also NSL, went all the way to semi-finals in their division playoffs.

The NRC also has a team in the West Los Angeles Industrial League consisting of top players from local aerospace companies. The Northrop netters, led by Don Theleman, Norair, recently won the league championship—for the third year in a row—in a torrid playoff match against Hughes.

John Potts, tennis commissioner, reports that NRC players have developed and improved their game through club play. He welcomes one and all to come out and give tennis a try.

"Mighty good for the waistline," says John. "And it's fun to win!"

NRC SURF FOLK TO HOLD ANNUAL AWARDS DINNER

The NRC Surf Fishing Club, John Pawlicki, commissioner, will hold its annual trophy night meeting February 4, 7:30 p.m. at the NRC Clubhouse, it has been announced.

Monthly trophies will also be distributed.

It will be a short business meeting, says John, with emphasis for the night on who is the best fisherman, strictly.

The faithful are all invited. Wives, kids, grandma too.

NORTHROP BLOOD BANK

AMERICAN RED CROSS + NATIONAL BLOOD PROGRAM

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CITY				ZONE	AGE
JOB TITLE				DATE OF BIRTH	
ORGN. NO.	SHIFT	EMPLOYEE NO.	EXT.	PLANT	LUNCH HOUR
SIGNATURE					

NORTHROP NORAIR NEWS

Issued biweekly by Norair Division of Northrop Corporation

• Wednesday, February 12, 1964

HAWTHORNE

PALMDALE

EDWARDS AFB

SAN ANTONIO



MILESTONE FOR THE F-5 FIGHTER—The first F-5B (two-seat series) was completed at Hawthorne last week and transferred to Edwards where she joins her F-5A sisters in the advanced flight demonstration program. Key men in the F-5 Advanced Production program that got the first "B" fighter out on schedule and with no—repeat no—shortages are from left, front. Frank Villaruel, Flight Test; Chester Delapp, Advanced Production; Clarence Stipe, Quality Control; Dave Hogarth, crew chief, Palmdale; Virgil Nolan, Quality Control; Rex Thornhill, superintendent, Advanced Production and Weld group; Harold Buckingham, Quality Control; John

Vilarino, foreman, Palmdale; Advanced Production's Bill Ensminger, Jim Walton, and Robert Walker; and Sterling Walters, Planning. From left, back row, Ralph Niehaus, Daniel (Ski) Kurzenski, Robert DeMartini, and John Valko, Advanced Production; Tommy White, Quality Control; Herman Meyers, Advanced Production; Manufacturing Control's Del Alexander, Ernie Sharp, Verne Keck, Bill Richardson, supervisor, Bill Raven, and Fred Farner; Harold Pedersen, A/P; John Krogstad, A/F Quality Assurance; Denny Pointon, supervisor, Q/C; Ted Jenks, A/P; John MacDonald, supervisor, Mfg. Control. For those who missed photo, see below.

Report to Congress . . .

President Johnson's 150-page report to Congress last week on the nation's vast activities in aeronautics and space carried explicit descriptions, mission purpose and government plans for Northrop's X-21 and F-5 fighter aircraft.

Quote President Johnson on two of our prideful products:

Laminar Flow Control Demonstration Aircraft

"The two X-21 Laminar Flow Control (LFC) demonstration aircraft began their flight tests this year. These aircraft, which are extensively modified WB-66's, have the so-called "wings that breathe." Suction through a large number of very fine slots in the surface removes the boundary layer air before it becomes turbulent, thereby reducing the friction drag.

"Refinements in the system since the first flight in April 1963 have gradually increased the area of the wing over which laminar flow is maintained to about 70% at low Reynolds numbers. If it can be perfected for the expected speed-altitude regime, it could be applied to a subsonic airplane of optimized configuration with an expected increase in range or endurance of up to 50%."

F-5A Tactical Fighter for Military Assistance Program

"The F-5A's are the first of 85 fighters currently on contract and being built for use by nations participating in the Military Assistance Program. Seventy-one of the aircraft will be single place F-5A's, the remaining 14 will be F-5B two-place trainer versions.

"Both versions of the F-5 are powered with General Electric J-85-13 turbojet engines with afterburners. The F-5 reverses a trend toward heavier and more complex fighter aircraft. It is designed as a light weight aircraft to provide high performance and reliability, low initial and operating costs, and minimum logistics requirements. It is suitable for a variety of missions including air superiority, reconnaissance, interception, close support for ground troops, and interdiction of enemy targets behind enemy lines.

"Both the F-5A and F-5B will carry Sidewinder missiles and auxiliary fuel tanks on their wing tips plus a variety of bombs, rockets, chemical stores and pylon fuel tanks on their five stations beneath the wings and fuselage. In addition to the aforementioned armament the F-5A will carry two 20 mm cannons mounted in its nose for aerial and ground attack missions. Its light overall weight, high thrust engines, leading and trailing edge wing flaps, parachute braking system and special design "sod field" landing gear make the F-5 capable of operating from disbursed airstrips less than 5000 feet long."

FIRST T-38 PILOTS SOLO AT VANCE AFB

CLASSROOM IS SEVEN MILES HIGH

VANCE AFB, Okla. — Seven miles high in the sky and all alone—it's quite a sensation to solo in the supersonic T-38 "Talon."

That's the way five student officers of the undergraduate pilot training program at Vance Air Force Base felt as they became the first pilot trainees at Vance AFB to solo in the T-38.

Number one man off the ground was Captain Curtis A. Peterson of Sheboygan, Wisconsin. He won the first take-off slot when his name was pulled from a cap in the Flight II briefing room by Colonel Philip G. Hallam, 3575th Pilot Training Group commander.

Following Captain Peterson's aircraft into the sky were Captain Darrel W. Fisher of Durango, Colorado; First Lieutenant Eugene A. Berger, jr. of Mansfield, Ohio; First Lieutenant Marden Hiatt of Delano, California; and Second Lieutenant Samuel H. Roane of Norman, Oklahoma.

The students are members of Class 64-H of the 3576th Pilot Training Squadron, the first class at Vance Air Force Base to make the transition to the T-38 in the second phase of their year-long training period. The 34-man class began its formal training in the "Talon" in December, and are soloing after an average of only 14 hours of airborne dual instruction.

Colonel James W. Little,

3575th Pilot Training Wing commander, commented on the accomplishments of Class 64-H.

"The performance of these men during the past few weeks has reflected a dedicated, professional approach on the part of students and instructors alike," he said. "It's extremely gratifying to see such self-confidence

(Continued on Page 2)

F-5 KNOW-HOW

Norair men down from Palmdale and Edwards to assist in the Advanced Production work on the F-5 airplanes, in addition to Foreman Vilarino and Crew Chief Hogarth who are listed in photo above:

From Edwards, Monte Montgomery and Milt Rogers, crew chiefs; Swede Johnson, hydraulics and Ed Ilecki, electrical.

From Palmdale, Harold Crawford, crew chief; George McDowell, electrical; Andy Dufrain, mechanic; Frank Large and Buck Benson, mechanics; and Gene Young, communications and navigation.

These men, who had already returned to their home bases at time of photo, are now "crewing" the new F-5As and Bs as Company and Air Force pilots put the fighters through demonstration paces.

Gratitude in Prose

Just prior to his death, in addressing "all fellow employees," John Kulluk, a Northrop man for more than 20 years and a highly respected member of Organization 5254, Tool Design unit, wished to thank all who made possible the multiple offerings of

that the next blood bank at Northrop will be conducted on February 19, just a week away.

John Kulluk was a good husband, father and worker. His dedication to the task at hand was an inspiration to his fellow associates and his demise has

By John B. Clark

Norair Director, Industrial Relations

blood transfusions during his long and progressive illness.



He passed away during the Christmas holiday.

So thankful and appreciative was Mr. Kulluk that he saw fit to document his gratitude for the Company's records. Joined by his family, they revealed that the blood donated by way of the Northrop blood bank numbered approximately 86 pints. If the Kulluk family had had to "buy" this, the cost would have been in excess of \$2100.

This story is so timely. It clearly demonstrates the great value to our people of our blood bank program and serves as a reminder

been a severe blow to all who knew and worked with him. John, with wife Alvina, son John, and daughter Mary Ann, lived in Gardena where he was recognized as a fine citizen and excellent neighbor. "My family and Northrop are my two loves," he used to say.

"The donors at Northrop saved my life," John remarked in a visit to my office a few months ago. Gave him extra weeks and days and hours, as we now know. That John was unable to rejoin us is our sorrow and we extend condolences to Alvina, young John, and Mary Ann.

Yes, John Kulluk is but one of ever so many Northrop people to whom the blood bank is a blessing and a comfort.

Let us mark all calendars for a date with our blood bank next visit. It will be Wednesday, a week. In memory of John Kulluk.

Pilots Solo at Vance

(Continued from Page 1)

and skill displayed at this relatively early stage of their training.

The Northrop-built T-38s have been arriving at Vance Air Force Base since last April. Part of the transition process from T-33 to T-38 has been the revamping of flight facilities to accommodate the complex aircraft, including the expansion of jet engine test stands from single to dual engine capacity, construction of storage shed and access road for storage of liquid oxygen, installation of new electrical power outlets in hangars, and enlargement of the instrument shop. Largest physical change necessitated by the transition is the proposed extension of the Kegleman Auxiliary Field runway, a facility to be used by T-38 pilots in practice landings.

Another aspect of the T-38 transition is the continual upgrading of Vance instructor pilots through special courses qualifying them to teach the techniques involved in flying the new, faster-than-sound trainer.

By May, the second phase of pilot training at Vance Air Force Base will be completely supersonic when all classes in that

phase will have been initiated into the T-38. The "Talons" will replace the obsolete T-33, a training version of the first USAF jet fighter, the F-80 "Shooting Star."

Because T-38 performance is similar to supersonic combat aircraft, utilization of the new trainer will make the transition to tactical aircraft such as the B-58 and the Century-series fighters much smoother for graduates of the undergraduate pilot training program.



FINAL CHECK — Captain Curtis Peterson, Sheboygan, Wisc., makes a final check of his instrument panel with Captain Paul Lasen, instructor, on the T-38 Talon, before taking off on his first solo flight in the supersonic jet trainer. Captain Peterson was selected by lot from the five Vance pilots in class 64-H who were ready to solo.

ZEPHYRS, HAWKS, WIND TUNNEL, LEAD HOOP RACE

At presstime the NRC basketball league standings as reported by Bill Greene, commissioner, are:

A league:

Zephyrs, won 4, lost 0; Big 8, won 3, lost 1; Elite, 2, 2; Celtics, 2, 2; Nortronics, 1, 3; and Gnus, 0, 4.

B league:

Hawks, won 2, lost 1; Wind Tunnel, 2, 1; Rejects, 1, 2; and Ratfinks, 1, 2.

Bill reiterates the fact that players are still needed to completely round out the 10 teams.

Big Spring Publisher Says:

Safety—Everlasting A-F Keynote

If you think safety is not the everlasting keynote in the Air Force—and doubled in spades in a flying training program—all you have to do is go out and take a flight.

This doesn't necessarily come easy, because the Air Force has things to do other than haul civilians around just so they can talk about it. But there was a little relaxation of schedules and yours truly got a ride in that new T-38. It's something my mouth had been watering for ever since that needle-nosed little mosquito of an airplane showed up at Webb Air Force Base.

I'm ready to go again.

But there's nothing left undone for the complete safety of any flight, and this is impressive to a layman.

AN OLD PRO

First of all, I drew one of the old pros in the T-38 business, Captain R. F. (Bob) Daley. He's chief of the standardization section at Webb, which means, literally, that he's a pilot's pilot. He knows that Northrop Talon from one tip to the other, and everything in between, and obviously is in love with it.

He outfitted me in all that paraphernalia (the worst part about the whole experience), very patiently gave me all the safety checkouts, saw to it that

the instructions sank into my muddled head, strapped me down in the rear cockpit and never let me out of his sight or hearing.

He was so good in explaining most of the major operations, the instruments, the lights and the handles, to advise in advance

By Bob Whipkey

when little strange noises might occur, or when the craft's attitude might change a bit, that he had me as confidently enfolded in his arms as if he had been my guardian.

Leaving me clear out of the picture, Bob Daley—as any other pilot—made a thorough check of weather, temperatures and all other factors affecting takeoff and flight before he ever got out of the operations building. At the plane, he gave it a complete checkout of all possible hazardous items. And let me say that there was a competent ground

struck me, and he was so oozing with confidence the whole time that he had me thinking that this was just another routine hour in my life. He even conned me into taking the controls for a few seconds, and had me all but believing that anybody could fly that T-38.

We zipped around over the San Angelo area for a bit, had a leisurely look around, then headed west over Big Lake straight and level at about 18,000 feet when he put on the gun and we slipped through the sound barrier.

THE SOUND BARRIER BIT

This is a mammoth scientific achievement, of course, but the fellow in the plane actually gets no sensation. You don't even know you're flying at real high speed unless you look down at the ground, and it is falling behind pretty darned fast. There might have been a bit of retardation for a second, perhaps a



SERIOUS BUSINESS—R. W. "Bob" Whipkey, publisher, Big Spring Texas Herald Tribune, gets checkout in safety procedures before a flight in the Northrop T-38 supersonic trainer. Pilot on flight was Captain Robert F. Daley, right.

crew right there, having things in order, and ready to see that the craft was perfect for a take-off.

PULLED BY A STRING

Once on the runway and canopies down, Bob began to talk to that little bird, and before you might count to ten (my counting abilities were a little frozen at the moment) it was pointing its nose what seemed to be straight up, and climbing as if some higher power were pulling it up on a yo-yo string.

And there I was flat on my back, to coin a phrase. Bob said we went by Garden City while I was still looking at the wild blue yonder.

Then he leveled her off, and the cockpit pressure was at norm, the air conditioning was coming in like cool and comfortable, man, the noise was all behind us, and we were chatting back and forth through our mask intercoms as casually as if we had been in my living room. And with no more vibration or noise, either.

Bob was helpful in explaining all the instruments and telling what we were doing. He had the instructor's attitude, the way it

slight tremble, but a layman would never know he hit that Mach 1 unless he kept his eye on the needle.

There's some pull on you when the T-38 takes on the burners, or when the throttle is eased off for a marked change in speed.

And you get those G forces principally on takeoff and when the pilot pulls the bird around on its wing for a turn, everything went to my head once, then everything went to my stomach once.

IT'S THE GETTING READY

It didn't hurt a bit, because here again I had ole Jockey Daley up there giving me the word on everything.

Zippering up in a flight suit, clamping down a helmet and an oxygen mask, and getting buckled into a parachute and strapped into the cockpit take a bit of doing, and will give a novice some uneasiness.

But once that T-38 is in the air, where it belongs, and a guy like Bob Daley is driving it with tender and loving care, all you have to do is sit back, relax, and enjoy it. There's that much aura of safety about the whole operation.

The World of the Norair Visitor Spins Smoothly



JOHN J. SIMPSON—Customer Relations Operations is his responsibility and business is getting better.

(The first in a series on Customer Relations personnel.)

Shake hands with John J. "Jack" Simpson, Norair chief, Customer Relations Operations group, and key man in the smooth-running world of a Norair visitor.

He is also known to his friends and baseball cronies as "Suitcase" after Harry "Suitcase" Simpson, major league star a few years ago. Jack himself played four years left field in college and later, in the farm system of the St. Louis Browns before being recalled for the Korean War.

INFO FOCAL POINT

At Norair, he is no less adept at fielding the myriad requirements posed by the steady stream of good people who come to our door, for Jack and his Operations staff constitute the focal point for all information on customers and guests here to see and be briefed on the T-38 supersonic trainer, the F-5 MAP fighter, our new twin overhead rail assembly lines, the LFC airplanes, the P.1127 program, Norsight, subcontract activities, R & D, management methods, plus a thousand other interesting things we do that people want to know about.

And C-R Ops business is getting better.

Jack reports the number of callers was up by 100 per cent in 1962; 75 per cent more in 1963.

"People come from the 50 states in the Union and practically all the nations in the world," states Jack. And there is nothing incongruous in the fact that he is a keen student of political science. There is a world map on the wall in his office with countries marked by a system of colored pins and flags to tell him just who the head man is and where, and what of the complexion today. This up-to-the-minute fix on governments helps more than you know in a job like Jack's.

SYMPOSIA

The two main functions of Customer Relations Operations group are to provide Division coordination and support for all symposia activities, other than the strictly technical, and to serve as the aforementioned central information point concerning customer visits and customer briefings. The symposia work entails attending the various industry and military functions such as the Air Force Association, AUSA, Navy League, Society of Experimental Test

Pilots, and this includes planning of Company activities and identification of people who should attend. Such affairs are important events in the management view and provide an excellent platform from which to renew acquaintances and to build customer and industry regard for Norair's technical and managerial competence.

Visitor arrangement responsibilities are also complex. Writing agendas, arranging for hotel accommodations, transportation, travel space, greeting guests, conducting plant tours, and all those thoughtful, helpful things that make the visitor more welcome, more comfortable, and more knowledgeable about Norair.

KNOWS THE PRODUCT

Jack has been with Northrop just a short time, since July 1962, but he is a 24-hour-a-day salesman of Company products. F-5 reaction time, T-38 trainer safety rates, the percentage of laminar flow on the LFC wing are facts and figures he can quote rapid-fire; and if he doesn't know he knows the Norair man who does know. A customer query to Jack is a sacred trust and must be answered truthfully and with integrity and dignity.

He is a member of the Society of Experimental Test Pilots and this past year served as chairman of the Society's seventh annual report. He flew 61 fighter-bomber missions in Korea, and then did a five-year stint as a test pilot in both the Air Force and at Lockheed.

Jack was educated at Park College of Aero-tech of St. Louis University receiving a bachelor of science in aeronautics, and also has semester time at San Francisco State toward his master's in world business.

Jack's phone number is 1516. Just give him a call. Customer Relations Operations will be happy to assist you at any time.

A CAFETERIA SURPRISE FOR LADY PATRONS

Knock, knock!
Who's there?
A surprise.
What kind of a surprise?
A Valentine surprise for all the ladies at the cafeteria. On Friday, February 14, noon lunch period.

Cal Poly Men Talk Campus Days



MUSTANGS AT NORTHROP REUNITE—A group of 21 California State Polytechnic College alumni employed at Northrop Norair and Northrop Space Laboratories held a reunion recently at the Western Avenue Country Club. Organized by alumnus Marshall Thompson, Dept. 1220, Engineering Compensation, they are, seated, left to right, Dave Imai, Wayne Maples, Paul Bewley, Marshall Thompson, Mike Montrose and Harvey Honda; standing, left to right, Lorin Mitts, Jim Piercy (GE representative to Northrop), Mark Gaskiewicz, Chuck Creasy, Dick Mirko, Bill McDowell, Dick Landru, Mike Sinclair, Phil Leckenby, John Dennis, Ron Osman (front), Larry Stone (rear), Ray Lavi, Joe McGuire and Jim Lile. Norair Cal Poly grads not attending were O. E. Compton, J. D. Isaac, Ray Kitaguchi and Walt Kolar, jr.

Northrop Norair News Wins High Honors for Safety, Bond Stories

The Northrop Norair News was awarded two top honors last week for work during 1963 in programs of vital importance to the nation and the community.

The first place citations were from the U.S. Treasury Department and from the Greater Los Angeles Chapter of the National Safety Council.

The honors were presented at an awards night banquet staged by the Southern California Industrial Editors Association. Making the presentations were Joe Kaplan, Safety Council secretary-manager, and Dick

Washburne, State Advertising and Promotion director, Savings Bonds Division.

A complete set of the 1963 edition of the Encyclopedia Britannica from the Savings Bond Division was presented to News Editor Charles Bradford, as part of the Treasury honor.

The Safety award was given for the year-long awareness program presented in the News starting with "Operation Safety" published last spring and sustained in following editions with the "Blue Ribbon" program.

Blue Ribbon safety is a drive launched last fall by Corporate Vice-president and Division General Manager Dick Nolan, to make Norair Division the safest industrial complex in the aerospace field.

Also figuring strongly in the safety award was the fact that Norair top management participated to the fullest, by taking the lead in insisting that personnel

regard safety as "everybody's business."

Proof of the worth of the program is in the steadily decreasing man-hour incidence figure for on-the-job accidents.

The Treasury award was in recognition for the part the News played in "Get on the Bond Wagon," last spring. During the payroll deduction campaign, 99.6 per cent of Northrop men and women signed up for bonds, an all-time record for the Company and one of the best participation showings in the nation.

Previously, Thomas V. Jones, Corporation president and chairman, who served during 1963 as aerospace-industry bond chairman, was presented a distinguished service medal from Treasury Secretary Douglas Dillon. All Northrop plants also were granted the honor of flying the Minuteman Flag. See Northrop Norair News, November 6 and 20 issues.

Huntsville Santa Proves Big Success

A belated report about Santa. Virge Maniago, administrative supervisor, Huntsville, sends word that the NSL Huntsville NRC held their first children's Christmas party at the facility with a whopping attendance of over 200 juniors.

Santa, as all good Santas should, gave out with Club-furnished toys and candy and plenty of the ho, ho, ho, jolly old gentleman routine. The affair was so successful that the space youngsters are already setting up a clamor for next December to hurry up and get here. The parents are content, however, to let time ravel out as it is supposed to.

Also from Huntsville way, Virge relates that the recent record snowfall brought out the artist in many aerospace folk with the snowmen on the lawn of almost every home in the city. NSL engineers pooled their talents and in a switch created a finely sculptured snow "Venus," complete with no arms yet.

The pale lady became famous in Huntsville and made the local papers.

Norair Bids Bon Voyage To First Retirees in '64

The following Northrop Norair people retired on January 1 of this year. The News joins their friends in bon voyage and fine fishing, exciting sightseeing, perfect touring, good camping, restful relaxing; even exhilarating south sea cruising.

All we ask is that they read the Northrop Norair News, which is being sent to them via life subscription, and keep in touch.

Robert Bryerton, Plant Protection.

Wm. LaFountain, Internal Audit.

For February 1:
Noreen Applegate, Cafeteria.
Fred Canavella, Purchasing.
Howard Converse, Electrical Maintenance.

Paul Dale, Templates and Form Tools.

Clarence Leach, Specification Control.

Paul Mallonee, Subcontract Planning and Control.

Merritt McKinnon, Electrical Maintenance.

Lewis Miller, Jig Construction.

Tom Robinson, T-38/F-5 Planning.

Wm. Schmidt, Jig Construction.

Reuben Snider, Honeycomb Braze.

Delbert Wallace, Raw Stock Material.

Jim Williams, Sheet Metal.

If you have a question concerning your own Northrop Retirement Plan benefits, call Dave Cocks, extension 2412.



RIDES WANTED

7 a.m. — 3:45 p.m.

KNOB HILL & PACIFIC COAST HWY., Redondo Beach. Roger W. Houah, ext. 2200. 372-5758.

8 a.m. — 4:45 p.m.

EUCALYPTUS & ARBOR VITAE, Inglewood. Denise Rosomme, ext. 2586. OR 2-7041.

LOS ALAMITOS & BRADBURY, Los Alamitos. R. L. Jones, ext. 2518, GE 1-9620.

LASSEN & WINNETKA, Chatsworth. Donald E. Tuttle, ext. 2382, 349-2241.

RIDES OFFERED

8 a.m. — 4:45 p.m.

LOS ALAMITOS & BRADBURY, Los Alamitos. R. L. Jones, ext. 2518, GE 1-9620.

LASSEN & WINNETKA, Chatsworth. Donald E. Tuttle, ext. 2382, 349-2241.

BBSF Classified Ads

BBSF classified ad service is provided free of charge to all Northrop Norair personnel.

Ads for agencies, commercial enterprises and private businesses are not accepted.

Deadline is noon Wednesday, one week before publication.

FOR SALE

REFRIGERATOR, GE, 11.5 cu. ft., 50-lb. freezer. \$55. OR 7-5276.

SKI BOOTS, lady's, 8 1/2, used once, imported. \$20. 675-6187 eveninas.

PLYMOUTH, station wagon, 1950, r/h, good paint & tires, 1964 license, \$110. ST 8-9709.

TWIN BED, box springs & mattress, \$20. 755-3805.

ANTIQUE FURNITURE, hand-carved design, rose & turquoise upholstery & down stuffed cushions, 19th century style, couch, \$400; love seat, \$300; chairs, 4, 2, \$125 ea.; 2, \$100 ea.; end tables, 2, & coffee table, \$150 ea.; or \$1200 for all items. RE 3-4738.

DOGS, Chihuahua, all ages & colors, reistered, \$20 & up. OS 6-4654.

RECORD PLAYER, RCA, \$15; violin, adult-size, \$10; formal, size 15-16, floor-length, \$8 ea. EX 7-2055.

BOAT, Fisherman, 15', small open cabin, 30-hp Johnson, trailer, life preservers, etc., \$375. 371-9730.

DUAL QUAD for Chevrolet 265, 283 & 327 w/alum. manifold, \$65. 677-4429 before 3 p.m. & weekends.

GUITAR, Gibson, 3/4-size, elec. w/case & amplifier. \$90. PL 9-2755.

FORD, Ranchero, 1957 1/2-ton pickup, air conditioning, new license, \$1000 or best offer. OS 5-8335.

FREEZER, Mana, upright, never used, still in crate. \$400. OS 5-3423.

REFRIGERATOR, Coldspot, \$25; bookcase, \$5; door hood, alum., \$5; Hide-A-Bed, \$50; bathroom fixtures, \$35. OS 6-1018.

PLYMOUTH, 1955 2-dr., \$225. OR 8-1692.

MOVIE CAMERA, 8-mm. Bell & Howell, elec. eye w/3 fast f/1.8 lenses, speeds 10-40. \$69.95. 398-7417.

MAD TICKETS SCARCE, BUT FEW REMAIN

Don't be mad.

Tickets are still available for the It's a Mad, Mad, Mad, Mad World, exclusive NRC showing.

A limited number of the coveted pasteboards remain at Personnel Activities. First-come, first-served, says General Supervisor Dick Pryor.

CHEVROLET, Impala, 1961 2-dr. h/top, auto., r/h, all power, air conditioning \$1700; Mercury, 1950 V-8 2-dr. coupe, r/h, std. shift, \$125. OS 9-3554.

STOVE, Wedgwood, \$50; mattress, full-size, 6" latex, \$30; shoes, white, size 9, worn once, \$5; pressure cooker, Presto 16 qt., \$15; car top, 16 cu. ft. w/rack & straps, \$35; mixer, Dormeyer, w/attachments, \$10; coat, sport, tweed, size 16. \$5. 634-5223.

CORVAIR MONZA, 1961, auto., 2-dr. 1-owner, \$1395. DA 3-9820, DA 4-3156.

FOR SALE

MARINE ENGINE, Chrysler Crown, 115-hp, less than 100 hrs. since o/haul. \$350. DA 9-3900.

PUP, French poodle, toy, pedigree, \$50 or best offer. FA 8-1054 eveninas.

HILLMAN, 1958 conv., \$380. PL 7-1903.

POOL TABLE, 7', all equipment, orig. cost, \$89. 1-yr-old, \$65. SP 2-1789.

REFRIGERATOR, 11' Admiral, dual temp. control, 56-lb. freezer across top, \$50. 672-8141.

WASHING MACHINE, Kenmore, 3-yr-old \$35; tuner, Sansui, plus amplifier stereo, 30-watts, speaker, \$125. 375-4967.

CORVETTE, 1960, 3-spd., r/h, w/s/w. engine recently o/hailed, new paint. 32,000 miles. \$2175. PL 4-5158.

CRIB, \$12. FR 4-8608.

WATER SKIS, single, \$7.50; double, \$12.50. FR 9-3294.

ROLLER SKATES, women's, size 7, w/toe stops. \$20. DA 3-9183.

PLYMOUTH, Suburban, 1959 V-8 wagon. 4-dr., r/h, auto. trans., good tires, engine recently o/hailed, \$790; lawn mower, 25", rotary cut, \$65. DA 6-7997 after 5 p.m.

LOT, A-704 on San Juan Rd., Desert Hot Springs. 65'x135' \$3850; Relax-A-Cizer. 110-volts, 60-cycle, 22-watts, \$50. CH 9-0787.

FORD 1952 4-dr., \$175. DA 3-3251.

SLEEPING BAG, dbl. w/foam mattress, \$20. FR 8-5175.

BOAT TRAILER, 2-wheel. \$75; Ford, 1951 2-dr., new trans, headliner & radiator, \$100; female collie, AKC reg., 21-mo-old, \$50. OS 6-3592.

FORD, 1955 deluxe, p/steering. 2-dr., \$350. 371-8977 after 4 p.m.

BICYCLE, racing-type, Terrot, 10-spd., many extras. \$85. FR 4-8094.

ORGAN, old pump-style, converted to air motor. \$35. OS 6-4744.

RIFLE, Savage, model 24, 410-22 over & under, w/ammo, \$25; butane tank. 25-gal., \$10; tap & die set, 3/16" to 1/4", std., \$10; misc. hand tools, pipe wrenches & taps, 3/16" to 3/4", various prices. PL 4-0817 after 4 p.m.

FREQ. METER, BC-221-AH w/calib. book. 115-volt, 60-cvde. \$30. 757-7244.

OSCILLOSCOPE, 7" Cathode Ray, RCA, \$70; VTVM, RCA, \$20; volt-ohm-meter. Phastron, \$20; signal generator, precision, \$25; TV alignment generator. Heathkit, \$15; TV black & white bar generator. Heathkit, \$5. 371-8701.

RECORD CHANGER, Girard A w/base-alex cover, audio empire stereo 108-head & 2-head, plug-in shells, \$50. PL 8-0374.

PORSCHE, 1955, 1500 Super Coupe, 9000 miles since complete o/haul of eng. & trans., new crankshaft, rod & main bearings, brakes, steering box, starter, leather upholstery, \$1295. GL 7-2949.

QUARTER MIDGET, McHal Helmet, full-race Continental engine, less than 80 hrs. \$450. TO 1-6404.

SHAMPOO TRAY, lae., hvy. cast iron, porcelain-coated, pastel green, complete w/chrome plumbing fittings & spray. \$15. OS 6-9989. OS 6-1983.

SLOOP, Blue Buoy, 14', fiberglass hull, Dacron sails, extras, incl. trailer w/1964 taas. \$900. 379-0600.

STENOLETE, mike, 1 tape magazine, 3-mos-old, \$200; carrying case, foot pedal & earpiece. \$35. RE 3-4738.

PLYMOUTH, 1957 2-dr., automatic, low mileage. \$250. 674-2997.

BEDROOM SUITE, Mel Eve corner table duo, maple, 4 lae. drwr., under beds & mattresses. \$200. PL 6-3025.

MORGAN 4-4, 1957, good top & ton. English Ford eng., 1964 license, \$450. 323-3609.

COUCH, brown w/new slip cover, approx. 6'. \$20; bicycle, girl's, 3-spd., hand brakes, good tires, black, \$20; table & 6 chairs, formica top, leas & chairs need paint. \$15. 376-9704.

AUTO RACK, fits all station wagons, adjustable, non-suction-type brackets, size 44 1/2"x59", 7" high, strap holders, \$15. OS 6-9518.

WANTED TO BUY

CAMERA TRIPOD, Quickset or similar hvy-duty. elevator. GE 1-4233.

CHEVROLET, 1955-1958, 6 or 8, stick, good condition & reasonable. OR 4-8541.

RENTALS OFFERED

APT, 1-bdrm., custom decorated, subterranean parking, pvt. decks & pool. \$137.50. 326-0474.

APTS, 1 & 2-bdrm., new deluxe, carpets, drapes, aarbae disp., elec. range, pvt. patios, near Northrop, 1-bdrm., \$110; 2-bdrm., \$130. OS 5-1708 after 4 p.m.

APT, 1-bdrm., furn., maple furniture, h/wood floors, disposal, enclosed yard, 10-min. to Northrop. \$97.50. PL 5-0630.

APTS, 2-bath, carpets, drapes, built-ins, dishwasher, aarbae, washer & dryer, Redondo, 1-bdrm., \$115; 2-bdrm., \$145. FR 2-0448.

HOUSE, unfurn., 2-bdrm., Inglewood, water pd., carpet, patio & aarbae, children ok, \$110 mo. AX 2-4958.

RENTALS OFFERED

APT, furn., single, bath w/tile shower, patio, aarbae, elec. kitchen w/disposal, ref. read., no pets, 100 yds. to beach. \$90 mo. FR 5-8938.

HOUSE, new, split-level, 3-bdrm., 1 1/2 baths, drapes, w/w carpets, built-ins, dble. aarbae, \$150 mo. 374-2433 eveninas or weekends.

HOUSE, 3-bdrm., new, 1 1/2 baths, built-ins, disposal, carpets, near San Diego Fwy. \$150. 830-1473.

APT, bachelor-type, completely furn. w/kitchen, ocean view, 3.5 miles from Northrop Palos Verdes plant, \$64 mo., utilities included. FR 7-1218.

APTS, new, 1 & 2 bdrm., garage, w/w carpets, built-ins, drapes, 1-bdrm., \$90; 2-bdrm., \$120. 679-8398.

APT, unfurn., 1-bdrm., aarbae, disposal, laundry room, El Segundo. \$75 mo. TE 0-3497. FA 2-0039.

APT, 1-bdrm., lae., unfurn., 2-yr-old, 1 mile to Northrop, redecorated, disposal & drapes, furn. avail., \$75 mo. OS 5-9695.

APT, 1-bdrm., furn., utilities pd., \$78 mo.; room w/pvt. entrance & bath, men only. \$10 wk. OR 2-4808.

APT, 1-bdrm., new, unfurn., incl. trash & water, \$90 mo. 679-9163 days, 679-1272 nights.

RENTALS WANTED

CAMPER, sleeping-type, for 1/2-ton pickup during month of July. EA 2-0714.

FOUND

BLUE JACKET, Lost & Found, Norair ext. 1972.

PERSONAL

I WISH to express my sincere appreciation to my friends & NRC for their messages of sympathy upon the loss of my father. FIVA M. HEALD.

FOR SALE OR TRADE

CLARINET, 1-pc. practice-type, motor 1 1/2-hp Sea King, trolling-type, \$35 ea. or trade either for cornet in fair condition. FR 2-6603.

NRC Netters Will Stage 5th Annual

Headline news for Northrop tennis players is that competition for the fifth annual NRC Club championships begins February 29. Tennis players from all divisions are invited to take part, states John Potts, commissioner.

The tournament will be played on the Compton Junior College courts with a variety of events for both men and women and geared to all levels of ability.

The first games will be men's C and D singles to be followed by open men's and open women's singles. Men's and mixed doubles will be next.

Entry blanks are available at Personnel Activities. Entry fee is \$1.25 for singles and \$2.50 a team for doubles. Deadline is February 19.

Tennis balls will be furnished by the NRC.

Ken Woelfel of Nortronics is tournament director.

John has also issued a special invitation for non-experienced tennis players to come out and take part in Club activities. He has an instruction class going that will help smooth out the rough spots.

VALENTINE TO BE THEME FOR SQUARE DANCERS

Valentine's Day will be the theme of the NRC Square Dance Club party scheduled for next Friday night, February 14.

"Wild Bill" Foross will do the calling.

Location is 15701 Crenshaw Boulevard in Gardena. Time is from 8 to 11 p.m. Cost is \$1 a person.

"Don't miss this one," says Dick Heise, commissioner. "There will be fun and surprises for all and prizes for the lucky ones."

NRC Offers Lecture Series On Personality and Self

"Understanding Ourselves and Others," a six-week lecture series presented by practicing psychologists from the American Institute of Family Relations, will be offered in the Northrop Recreation Club Clubhouse, 12917 Cerrise, from 5 to 7 p.m. Mondays, beginning March 2.

Sessions will be open to all Northrop personnel and their immediate families with enrollment limited to 125. Early registration is advised. Series fee is \$10 payable at the time of application.

The course will examine the how's of coping with life and its problems with discussions being conducted by Dr. Donald Wilson, director of counseling at the Institute, and staff members Dr. Ruth Michaelson, certified psychologist, and Dr. Joseph Bressler, clinical psychologist.

A question period will follow each session.

Program headings are below.

March 2—What are you of?; March 9—Taking a look at your unique personality; March 16—Paving your road to maturity; March 23—How to recognize a personal neurosis you have one; March 30—Getting along with people; and March 6—Getting along well with spouse.

For information and fee payment, contact Personnel Activities.

SPORTS CARS PLAN RALLY AND PARTY

A poker rally and a party next on tap for the NRC Sports Car Club.

This will be the event of the month for February. It will place Saturday night, February 15.

Rubber starts burning 7 p.m. at 120th Street and 12th in the Johnson parking.

Equipment needed includes flashlight, a navigator (no previous experience required), an automobile and driver.

Particulars are available Personnel Activities.

NEW DATE SET FOR STAMP CLUB MEETINGS

Future meetings of the Northrop Stamp Club will be on the third Monday of each month. Commissioner Tom B announced that the next meeting of the Club will be held at 7 p.m., February 17, at the Clubhouse.

Details of the forthcoming F-5B first day cover will be discussed and plans will be made for the cachet commemorating Northrop's 25th birthday.

All Northrop employees and their families are eligible for membership in the Club.

Blue Ribbon Workers



SAFETY CHECK—This doesn't happen at Norair but just in case, News readers are looking at a hazardous safety condition, one which should have been corrected or reported by anyone passing by. Parts left protruding into aisle, can hurt workers, can damage equipment, can themselves be damaged. John Lynn, 5503 foreman, and Henry Carrillo, extrusions, and one of safety committee reps for the organization, posed for staged photo to help tell the story. Division hopes that 1964 will be a blue ribbon year, and safety is everybody's business, okay.



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